

A
DISCOURSE
ON THE
SMALL-POX
AND
MEASLES.

BY
RICHARD MEAD, M. D.
Physician to King GEORGE II. &c.

To which is annexed,
A TREATISE on the same diseases, by the celebrated Arabian physician ABUBEKER RHAZES.

THE THIRD EDITION.

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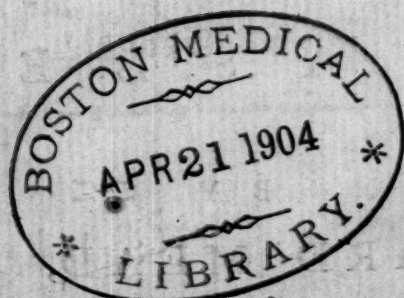
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A DISCOURSE on the SMALL-
POX and MEASLES.

APR 21 1904

P R E F A C E.

A Considerable part of this discourse was written by me many years since; and the whole had been finished and given to the public long ago, would the business of my profession, in which I have been constantly engaged, have allowed me time to do it. However, I flatter myself, that this intermission of the work will in the main turn to the advantage of the reader: because whatever inconveniencies may attend age, they are for the most part amply compensated by daily acquisitions of knowledge and experience. Wherefore, without farther apology, I shall now briefly lay down the motives which first induced me to write on this subject.

In the year 1717 the learned Dr Freind published the first and third books of Hippocrates's epidemics, illustrated with nine commentaries concerning fevers. Of these the seventh treats of purging in the putrid fever, which follows upon the confluent small-pox; and, in support of his opinion, he has annexed to it the letters of four physicians to himself on that subject; one of which is mine. For after having been several years one of the physicians to St Thomas's hospital, in the year 1708, I observed, that some of my patients recovered from a very malignant sort of small-pox, even beyond expectation, by a looseness seizing them on the ninth or tenth day of the disease,

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and sometimes earlier. Hence I took the hint, to try what good might be done by opening the body with a gentle purge on the decline of the distemper, especially where the patient had constantly been costive from the beginning; which is far from being an uncommon case. The success was in a great measure answerable to my wishes: for, by this method, I recovered many who were in the most imminent danger.

At that time, and indeed during the remainder of his life, I was strictly joined in friendship with Dr Freind; and as we frequently conversed on the business of our profession, I explained this point of practice to him, and met with his approbation. Soon after this, he was called to a consultation with two other eminent physicians, on the case of a young nobleman, who lay dangerously ill of the small-pox: whereupon he proposed my method. But they obstinately opposed it until the fourteenth day from the eruption, when the case appearing quite desperate by convulsions with a lethargy coming on apace, they consented to give him a gentle laxative draught; which had a very good effect. Hereupon Dr Freind gave his opinion to repeat it; but that was over-ruled, and the patient died the seventh day after. The doctor himself has given an ample account of this case*.

This affair soon made so great a noise, that even the gentlemen of the faculty were divided upon it; some commending, others finding fault with Dr Freind's advice: which so essentially affected his reputation, that he thought himself under a necessity of

* Freindi opera, p. 263.

vindicating it: and therefore he entreated me to send him the purport of our former conversation in writing. Such was our friendship, that I soon complied with his request; and he shewed my letter to Dr Radcliffe, (who at that time was very deservedly at the head of his profession, upon account of his great medical penetration and experience, and had honoured me with a considerable share of intimacy), and told him withal, that he intended to publish his defence. Whereupon Dr Radcliffe obtained leave of me for Dr Freind to annex my letter to his book. But after two or three sheets had been printed off, he was prevailed on by some friends to drop his undertaking: and thus both his work and my letter lay by for some years, that is, until he published his commentaries on fevers. While he was employed in this work, he had fresh thoughts of printing the aforesaid letter with it; for which purpose I revised and enlarged the letter, translated it from the original English into Latin, and, in short, new-modelled it into the form in which it appears in that book.

It very rarely happens, that a new method of cure in any disease gives universal satisfaction: however, not only Dr Freind and myself invariably persisted in this from the first time I mentioned it to him; but several physicians likewise, both in town and country, to whom we imparted it, found its salutary effects. But there never are wanting some men of so invidious a turn of mind, that their principal pleasure consists in blackening the reputation, and decrying the productions of others; as if what they strip their neighbours of, was to be added to their own characters. Thus Dr Freind's book had no sooner appeared in public,

but some of this stamp flew to arms, as if to save the commonwealth. In front of this band stood forth Dr John Woodward, physick-professor at Gresham-college, a man equally ill-bred, vain, and ill-natured, who, after being for some time apprentice to a linen-draper, took it into his head to make a collection of shells and fossils, in order to pass upon the world for a philosopher; thence having got admission into a physician's family, at length, by dint of interest, obtained a doctor's degree. This man published a book, entitled, *The state of physick and diseases* *, wherein he took great liberties with Dr Freind, and those in the same sentiment with him, but pointed his arrows most particularly at me; and these were neither arguments nor experiments, of which he had none, but barefaced calumny and raillery, which he poured forth in abundance. It is much against my will, that I thus revive the remembrance of that libel, which already is well nigh sunk into oblivion; and for which the author has been justly exposed by Dr Freind: nor should I have wasted paper on this insignificant story, had not the arrogance and vanity of the man extorted it from me. And, in fine, if I have dwelt longer on this whole affair than might be expected, my motives were, first, to explain who was the author of this method of practice, and then, how little foundation Dr Woodward had for his personal reflections and brawling.

Now, as to what concerns this discourse, I must inform the public, that I have preferred perspicuity to flowers of language, by delivering every precept in as few words as to me seemed consistent with a clear

conveyance of my notions : and I have added some particular rules and cautions relating to cathartics, for the sake of young physicians chiefly ; who are often disposed too rashly to attempt, and too eagerly to embrace every novelty in practice, especially when handed down to them from persons of whom they have a high opinion. For nothing can be so universally useful, as not to be liable to some exception ; and it is sometimes as great a mark of sound judgment, not to do mischief, as to do good *. Wherefore, not only in this case, but in all others within the compass of our art, the physician ought constantly to remember that of the poet †,

Nothing does good, but what may also hurt.

When I had finished this small work, I thought it might be no less agreeable than useful to the gentlemen of the faculty, if to it I annexed Rhazes's treatise of the small-pox and measles, faithfully translated from the original Arabic into Latin : as it contains an ample detail of many things relating to the nature and cure of these diseases, which, making proper allowances for time and place, coincide pretty much with the doctrines I have laid down. And indeed, it has given me no small pleasure, to see my sentiments confirmed by the greatest physician of the age he lived in. But I have often wondered how it came to pass, that this book had never before been published either in Arabic, or in Latin from the Arabic. Robert Stephens was the first who published it in Greek, at the end of his edition of Alexander Trallian's work in the

* Hippocrates in his first book of epidemics.

† Ovid, trist. lib. ii. ver. 266.

year 1548 *. The Greek copy has been translated into Latin by three several persons ; the first of whom was Georgius Valla of Placentia, whose version was published at Venice, A. D. 1498, and went through several editions. This was followed by a second, done by Johanes Guintorius of Andernac, printed at Strasbourg in 1549 : and Nicolaus Macchellus, a physician of Modena, put forth a third, printed at Venice in 1555, and again, in 1586 †. Now, the Greek copy was not translated directly from the Arabic, but from a Syriac version, which latter seems to have been done for the use of the common people ; and upon comparing the Greek with this Latin translation from the Arabic, which I now publish, it will appear very inaccurate, by the entire omission of some things, and faulty rendering of others ; whether through the insufficiency, or negligence of the Syriac or Greek translator, I shall not determine. But the manner how I acquired my copy is this.

After having caused a diligent search to be made in our public libraries for an Arabic copy of this treatise to no purpose, I wrote to my good friend the celebrated Dr Boerhaave, professor of physic in the university of Leyden, entreating him to inform me, if such an one could be found in the public library there, which I knew to be very rich in Arabic manuscripts. A copy was accordingly found, which he got transcribed by the Arabic professor, and kindly sent it over to me ; but it proved to be full of faults. This, however, I gave at two separate times to two gentlemen of character, to put it into Latin. One was So-

* The Greek title is, 'Ραζὴ λόγων περὶ λοιμικῆς.

† Vid. Fabricii bibl. Græc. vol. xii. p. 692.

lomon Negri, a native of Damascus, extremely well versed in all the Oriental tongues; the other John Gagnier, Arabic reader at Oxford: and they both performed the task with great diligence. But upon comparing the two versions I observed that they differed in several places, not in the diction only, but even in the sense: wherefore, as I have no knowledge of the Arabic tongue, I could not determine which of the two to prefer. This uncertainty made me apply to my worthy friend, the Reverend Dr Thomas Hunt, for several years past Arabic professor in the university of Oxford, and lately made Hebrew professor likewise, who, among his many eminent qualities, is universally esteemed a great master of the eastern languages. This gentleman, at my request, generously undertook the province of strictly collating the two Latin versions above mentioned with the Arabic copy, in my presence; and out of them he compiled this, which I now give to the public; and doubtless he would have made it much better, had the Arabic copy been more correct.

London, Sept. 29.

1747.

A

A DISCOURSE on the SMALL-POX and MEASLES.

C H A P. I.

Of the origin of the small-pox.

BEFORE I enter on the medical part of my subject, I shall briefly inquire into the origin of the small-pox, and the manner of its propagation from those countries where it first appeared, almost over the whole face of the earth, as far as I can trace it in history: for these points once settled will throw a considerable light on the nature of the distemper, and the methods of cure, which I shall propose in the sequel of the discourse,

That this is a modern disease, whereby I mean, that it was not known to the ancient Greek and Roman physicians, is to me a matter beyond all doubt. For I think they are widely mistaken, who endeavour to prove, that the anthrax, epinyctis, and such like eruptions on the skin, were our small-pox: because it is more than probable, that the ancient physicians, who were extremely diligent in the description and distinctive characteristics of all diseases, would not have been content with barely mentioning this, which is so contagious, and makes such dreadful havock among mankind; but would have minutely described it, had they been acquainted with it.

Wherefore we must have recourse to the writings of the Arabian physicians for the first notices of this disease. The chief of these was Rhazes, who lived
about

about the year of Christ 900. We have a large volume of this great man, published under the title of his *Continent*, a treasure of physic, which seems to have been compiled from his common-place book. In this he informs us, that a physician, whose name was Aaron, (who wrote thirty books of physic), had treated of the diagnostics, the various kinds, and the method of cure of the small-pox *. Now, this Aaron was born at Alexandria, and in the reign of Mohammed practised about the year 622 †. Whence the learned Dr Freind conjectured, that possibly the small-pox took its rise in Egypt ‡. But the origin of the disease is carried farther back than the time of this Aaron, by Dr John James Reiske, who says that he read the following words in an old Arabic manuscript of the public library at Leyden : “ This year, in fine, the small-pox and measles made their first appearance in Arabia ||.” By this year he means that of the birth of Mohammed, which was the year of Christ 572.

Now, upon mature consideration of the whole affair, I am inclined to think that there are certain diseases, which are originally engendered and propagated in certain countries, as in their native soil. These by Hippocrates are called diseases of the country † ; and some of them, sprung up in various parts of Europe and Asia, from peculiar defects in the air, soil, and waters, he has most accurately described ‡ : but the more modern Greeks call them *endemic diseases* ++.

* Contin. 419. 2.

† Vid. Abulpharajii hist.

dynast. p. 99.

‡ Oper. p. 330.

|| Hoc

demum anno comparuerunt primum in terris Arabum variolæ & morbilli. Disp inaug. Lug. Bat. 1746.

† Νεοήματα ἐπιχώρια. + Lib. de aëre, aquis, & locis.

++ Ἐνδημίας. Vid. Galen. com. i. in epidem. Hip.

These, in my opinion, always existed in their respective native places, as proceeding from the same natural causes perpetually exerting themselves.

It is found by experience, that some of these are contagious, and that the contagion is frequently propagated to very remote countries by means suitable to the nature of this or that disease. For some not only communicate the infection by immediate contact of the sound with the morbid body, but have such force, that they spread their pernicious seeds by emitting very subtile particles; which lighting on soft spongy substances, such as cotton, wool, raw-silk, and cloathing, penetrate into them, and there remain pent up for a considerable time: in the same manner as I have elsewhere accounted for the wide progress of the plague from Africa its original country*. Others, on the contrary, are infectious by contact alone. Wherefore the first sort may be spread by commerce, but the latter by cohabitation only.

Of this kind is the venereal disease; which, according to historians of the most undoubted credit, is a native of some of the American islands, especially Hispaniola, and was brought over into Spain near the end of the fifteenth century: thence, in the year 1495, it was carried to Naples, during the war between Ferdinand of Arragon and the French, by some Spanish troops, who had contracted it in the aforesaid island. For these and the French soldiers having at different times had communication with the same women, according as the same towns alternately fell into the hands of the two contending parties; this filthy disease first spread itself over the two armies;

* Discourse on the plague, part i. chap. 1.

thence made its way into Italy, and has since infected most parts of the habitable world *.

And I very well remember, that a certain English merchant, who had resided many years in Muscovy, assured me, that the venereal disease was hardly known in that country before the reign of the late Czar Peter the Great : because till that time the traffic carried on by the Muscovites did not require much communication or dealing with foreigners. But after that emperor had taken the resolution of visiting other parts of Europe, and had sent many of his subjects abroad to learn trades and manufactures ; these carried back with them the dire effects of their unlawful lust into their native country ; which raged there with the greater severity, as inflammations and ulcers are the more difficult to be cured in cold climates.

But to return to the small-pox : I really take this disease to be a plague of its own kind, which was originally bred in Africa, and more especially in Æthiopia, as the heat is excessive there ; and thence, like the true plague, was brought into Arabia and Egypt after the manner above mentioned.

Now, if any one should wonder why this contagion was so long confined to its native soil, without spreading into distant countries : I pray him to consider, that foreign commerce was much more sparingly carried on in ancient times, than in our days, especially between mediterranean nations ; and likewise, that the ancients seldom or never undertook long voyages by sea, as we do. And Ludolfus observes, that the Ethiopians in particular were ignorant of

* Vid. Astruc de morbis venereis, lib. i. cap. 10. 11.

mercantile affairs *. Therefore, when in process of time the mutual intercourse of different nations became more frequent by wars, trade, and other causes; this contagious disease was spread far and wide. But towards the end of the eleventh century, and in the beginning of the twelfth, it gained vast ground, by means of the wars waged by a confederacy of the Christian powers against the Saracens, for the recovery of the Holy Land; this being the only visible recompense of their religious expeditions, which they brought back to their respective countries. From that time forward, wheresoever this most infectious distemper once got a footing, there it has obstinately held uninterrupted possession. For the purulent matter, which runs out of the pustules, being caught in the bed-cloaths and wearing apparel of the sick, and there drying, and remaining invisible, becomes a nursery of the disease, which soon breaks forth on those who happen to come in contact with it; especially, if the season of the year, and state of the air be favourable to its action.

In this place, it may not be improper, in confirmation of the foregoing doctrine, to relate the following fact, which was attested to me by a gentleman of great experience, who had been for many years governor of Fort St George in the East Indies. While he was in that post, a Dutch ship put into the Cape of Good Hope, some of the crew of which had had the small-pox in the voyage thither. The natives of that country, who are called *Hottentots*, are so wild and stupid, that they might seem to be of a middle species between men and brutes; and it is their cu-

* Hist. Æthiop. lib. iv. cap. 7.

stom to do all servile offices for the sailors who land there. Now, it happened, that some of these miserable wretches were employed in washing the linen and cloaths of those men who had had the distemper: whereupon they were seized with it, and it raged among them with such violence, that most of them perished under it. But as soon as fatal experience had convinced this ignorant people, that the disease was spread by contagion, it appeared, that they had natural sagacity enough to defend themselves. For they contrived to draw lines round the infected part of their country, which were so strictly guarded, that, if any person attempted to break through them, in order to fly from the infection, he was immediately shot dead. Now, this fact seems the more remarkable, as it evinces, that necessity compelled a people of the most gross ignorance and stupidity to take the same measure, which a chain of reasoning led us formerly to propose, in order to stop the progress of the plague *; and which, some time after, had a happy effect, not only in checking, but even entirely extinguishing that dreadful calamity in France, where it broke forth, and threatened the rest of Europe with destruction.

C H A P. II.

Of the nature and sorts of the small-pox.

HAVING sufficiently proved, in the preceding chapter, that the small-pox is a disease of the pestilential tribe; in order to a clearer knowledge of its

* Discourse on the plague, part ii. chap. 2.

nature, I will briefly premise my notions of pestilence.

All fevers which attack the whole body, may be conveniently ranged under the three general heads of simple, putrid, and pestilential.

Simple fevers arise from a long-continued excess of velocity in the motion of the blood, and its consequences, a disturbance of its due mixture, and an interruption of the secretion of the humours in the several parts of the body.

Putrid fevers are caused, when, together with a concurrence of these circumstances, a lentor ensues in the capillary blood-vessels; and as this sily blood is gradually pushed forward by the force of the circulation into the veins, it there becomes putrid, and impregnates the rest of the mass with a malignant quality, which is communicated both to the internal and external parts of the body.

Pestilential fevers, in fine, I call all those which are accompanied with some sort of poison. Now, of whatever nature this happen to be, it not only infects and corrupts the blood, but more particularly seizes on the subtile nervous liquor, which is called the animal spirits. Hence it is, that these fevers act with greater rapidity and violence, and are much more fatal than the other sorts. But this one circumstance is common to all fevers, that nature endeavours to conquer the disease, by raising some struggle or other, in order to throw forth from the body whatever is prejudicial to life.

Now, whereas the word *nature* is made use of by physicians in the cure of all diseases, I will here, once for all, plainly declare my sentiments of what

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we ought to understand by that word. That there is something within us, which perceives, thinks, and reasons, is manifest beyond contradiction; and yet the nature of that something cannot be fully and perfectly comprehended in this life. Wherefore I shall resign the disquisition of this point to those, who, while they know too little of, and care less for things falling under their senses, take great pleasure in investigating those things which human reason is incapable of conceiving. However, thus far the soundest philosophers agree concerning it, that it is somewhat incorporeal. For how can sluggish matter, which is of itself void of all motion, be the source and first cause of thought, the most excellent of all motions? Wherefore, it is sufficiently evident, that this first mover within us is a spirit of some kind or other, entirely different and separable from terrestrial matter, and yet most intimately united with our body.

Moreover, to me it seems probable, that this active principle is not of the same sort in all; that the almighty Creator has endowed man with one sort, and brutes with another: that the former so far partakes of a divine nature, as to be able to exist and think after its separation from the body; but that the latter is of such an inferior order, as to perish with the body. The former was by some of the ancients called *animus*, the latter *anima* *; and they believed, that they were both ingendered in our spe-

* Juv. sat. xv. 148.

Mundi

*Principio indulgit communis conditor illis
Tantum animam, nobis animum quoque.*

Vide etiam Davissii not. ad Ciceron. Tusc. disput. lib. i. cap. 10.

cies : but this I take to be an erroneous position. For as their *anima* suffices for the functions of life in brutes, so our *animus* stands not in need of such an assistant. Now, this matter, if I am not mistaken, stands thus : such is the composition of our fabric, that, when any thing pernicious has got footing within the body, the governing mind gives such an impulse to those instruments of motion, the animal spirits, as to raise those commotions in the blood and humours, which may relieve the whole frame from the danger in which it is involved. And this is done in so sudden a manner, that it should seem to be the effect of instinct, rather than voluntary motion ; though it be effected in us at the command of the *animus*, and in brutes by the power of the *anima*. And indeed, those very motions which are commonly called natural and vital, as those of the heart, lungs, and intestines, which persevere through the whole course of life, even when the will cannot be concerned in them ; as they have their beginning from the mind, so they are perpetually under its direction. I could easily bring many arguments in confirmation of these sentiments, but they would be superfluous in this place. Besides that I am happily anticipated by the learned and ingenious Dr Porterfield, fellow of the royal college of physicians at Edinburgh, who, in a curious dissertation published some years since *, has treated this subject with such perspicuity, that there can be no room left for doubt.

But from philosophy I return to medicine. Our sagacious Sydenham was so far of this opinion, as to

* Vid. medical essays published at Edinburgh, vol. iii. essay xii. and vol. iv. essay xiv.

assert, that a disease is nothing else but an effort of nature to throw off the morbid matter, for the health of the patient *. And Hippocrates, in his usual manner, laconically expressed the same thing thus : " Nature is the curer of diseases †." Now, this I have observed more particularly in pestilential fevers, in which the violence of the distemper breaks forth on the skin in the form of pustules, carbuncles, and buboes ; all which are the very venom of the disease, as the common experiment of giving the small-pox by inoculation plainly demonstrates. Thus having made it appear, that the small-pox is an invenomed fever, I come to explain its different sorts ; for as to its history, I refer to Dr Sydenham, who was the first that divided its whole course into certain stages, and gave the method of cure in each.

Most authors divide the small-pox into the distinct and confluent sorts, and estimate both sorts by the size, number, and manner of eruption of the pustules. But in the prognostic, they make so wide a difference between them, that they pronounce the former sort to be almost void of all danger, but the latter always dreadful in its consequences. Thus much indeed is most certain, that the confluent sort are, generally speaking, much worse than the distinct, and that many more die of those than of these. But yet it sometimes happens, that a distinct sort may prove more dangerous than the common confluent sort. Moreover, there are many symptoms extremely dangerous, which are peculiar to the distinct kind, as I

* Observation. medic. circa morborum acutorum historiam, at the beginning. † Νέσων φύσις ἐντεροί. Epidem. lib. vi.

shall shew anon. For the danger does not so much arise from the quantity of the purulent matter, as from other circumstances, which shall be explained in their due place.

Wherefore, in my opinion, the small-pox may more accurately, and agreeably to the nature of the disease, be divided into simple and malignant.

I call simple all that sort, in which the eruption is attended with a slight fever of short duration, the pustules fill kindly, make good matter in a few days, and, in fine, fall off in dry scabs.

The malignant sort is that, in which the eruption appears with a malignant fever, the pustules hardly come to any tolerable degree of maturity, and either suppurate not at all, or if they do in some measure, as the fever is never off, it is with great trouble that they at length end in little crusts.

That malignity appears in such various forms, according to the different nature of the pustules, that its characteristic signs have given various appellations to the small-pox : whereof the chief differences, which have fallen under my observation, are these that follow. For the pustules are either crystalline, warty, or bloody. I am well aware, that authors have run into a greater number of subdivisions ; but I look on the rest to be either a combination of some or all of these, or only different degrees of the same kind : a thing which frequently happens in an irregular disease.

I call those pustules crystalline, which, instead of thick, well-digested matter, contain nothing but a thin, pale water, and are in some measure pellucid.

And

And this sort is sometimes observed, not only in the confluent, but also in the distinct small-pox.

They are called warty, when the pustules contain no fluid, but grow hard and prominent above the skin in the manner of warts. These are peculiar to the distinct sort.

The bloody pustules are produced more ways than one. For I have seen cases, where, at the very beginning of the disease, the pustules were so many small tubercles full of blackish blood, resembling those raised on the skin when pinched with a forceps. And these were followed by an intermixture of purple and livid spots, such as physicians describe in the true plague. But it more frequently happens, that pustules coming out very thick, on the third or fourth day after, when they ought to fill, become livid, and a little bloody, with black spots spread over the whole body; which forebode death in a day or two, because they are real gangrenes. It very often falls out at this time, that a thin blood flows not only out of the patient's mouth, nose, and eyes, but also by every outlet of the body; but more especially by the urinary passages, through which it likewise issues sometimes on the first days of the distemper. These are manifestly of the confluent sort.

To these Dr Freind * has added a fourth kind of small-pox, which he calls *siliquose*, in which the pustules resemble little round, soft, hollow bladders, and contain no fluid. But this I place among the crystalline sort; the only difference between them being, that in this case one part of the fluid, which had been thrown into the pustules, flies off through

* Epist. de quibusdam variolarum generibus.

the skin, and the other is absorbed by the lymphatics back into the body.

It is always a difficult task, and sometimes a needless one, to investigate the true causes of things. But as the public may perhaps expect, that I should account for the above-mentioned differences in this disease; I shall say, that the principal reasons of these differences, which have occurred to me upon mature consideration, are, the almost infinite variety of temperaments in various individuals; the seasons of the year and their changes, and in fine, many accidents which befall the body, between the time of catching the infection and the appearance of the disease. For inoculation shews, that the small-pox does not break forth before the eighth or ninth day from receiving the infection.

Possibly it may be thought strange, that, in enumerating these causes, I have not mentioned a word of the nature of the infecting particles. But, besides that the knowledge of this is not attainable by us, it seems to have no great influence on the production of this or that particular sort of the distemper. For we frequently observe, in the same family, where one person catches it from another, that some have a favourable, and others a bad sort.

But such is the power of temperaments of body, that they descend to those of the same blood by a sort of hereditary right: whence some diseases are found to be familiar and fatal to certain families.

As to the seasons of the year, we find, by daily experience, that some of them are fitter to produce certain diseases than others; that they are the causes of epidemic fevers; and that those chiefly, in which
some

some fluid is to be thrown off by the skin, are the most remarkably liable to be affected by their changes.

But numberless are the things comprehended in the third article, to wit, all those accidents which happen to the body from the time of taking the infection to the eruption of the pustules. For the poison is far from lying quiet all this while, but is constantly and gradually exerting its malignity, by first corrupting the animal spirits, and then the whole mass of blood and humours. Wherefore, if bodily exercise, diet, or the affections of the mind (which have great power in this case) should happen to make any particular alteration in the fermenting fluids, they may easily occasion various sorts of pustules, possibly in the manner I am going to explain.

The simple small-pox are suppurations made, while the blood is not so far vitiated, but that the derivations of the humours into the proper parts may be effected tolerably well, and the natural functions are not entirely hurt. But in the malignant sort the case is quite different. For the whole mass of humours is corrupted more or less, according to the nature of the disease; and the blood is in such confusion, that the purulent matter cannot be thrown upon the skin. Now, in this case, sometimes a thin fluid is thrown out, which, when watery, makes crystalline pustules; when thick and viscid, warty; and filiquose, in fine, when the fluid has been resorbed by the lymphatics into the blood, and has left the pustules quite empty. Besides, the texture of the blood is too frequently broken to that degree, that it is obstructed, and stagnates in the small vessels: whereupon, the
skin

skin is strewed with black spots, which are so many real gangrenes, and hæmorrhages ensue through all the outlets of the body ; whence this is called the bloody fort. That these horrid symptoms are the effects of an acrid poison, appears plainly ; because the same happen to those who have been bit by the hæmorrhoids, a Lybian serpent, according to Lucan's beautiful description :

A fierce hæmorrhoid struck both his fangs
 Deep into Tullus ; a brave valiant youth,
 And fond admirer of great Cato's worth,
 And as Corycian saffron, when 'tis squeez'd,
 Pours forth its yellow juice through all the holes
 Of the hard pressing boards ; so from the pores
 Of all the parts flow'd ruddy venom'd gore.
 His tears were bloody ; nature's passages,
 For their own humours, were all fill'd with blood.
 His mouth, his nose, chok'd up with filthy clots :
 Red sweats transpir'd from all the skin inflam'd.
 His body seem'd one universal wound *.

But from these objects of terror, it is time to pass to those which may afford comfort.

C H A P. III.

Of the methods of cure in the small-pox.

IT is most evident, that all pestilential diseases are accompanied with the highest inflammation of the blood and humours, and therefore they all require emptying and cooling. I begin with the simple small-

* Lib. ix. ver. 806.

pox, and shall afterwards descend to the treatment of the malignant sort in its several varieties.

But in this place it seems proper to clear up two material points. The one regards the management of the sick, and the other, the diet proper for him.

With respect to the first, serious attention should be given both to the season of the year, and to the strength of the patient. For the same things that are done with safety in summer, may be attended with danger in winter; and young lads or robust men easily bear what might destroy infants, or weakly women. But let this be a general rule, to keep the patient in bed during the first days of the distemper, taking care to defend him from the inclemency of the winter by proper means, and to moderate the excessive heat in summer by cool air. But to chill and as it were to freeze up the sick in winter, is not the part of a prudent physician, but that of a fool-hardy empiric, trying experiments at the expense of unhappy people's lives. Wherefore a mean is to be observed herein, by managing the patient in such a manner, as neither to stifle him with heat or cloaths, nor check the eruption and perspiration by cold. However, great care ought to be taken in general, to supply him with pure and cool air, which he may take in plentifully: because a hot air causes difficulty of breathing, checks the secretion of urine, and increases the number of pustules on the internal organs of the body; the consequences whereof we may justly apprehend to be inflammations, and, towards the end of the disease, gangrenes.

With regard to diet, it ought to be very slender, moistening, and cooling; such as oatmeal or barley-gruel,

gruel, &c. Nevertheless, as the food is to be adapted to the several stages of the disease, the best regimen in the beginning is that which will keep the body open, and promote urine. These advantages are obtained by boiling preserved fruits with their food, especially figs, damascene plums, and tamarinds; and giving them subacid liquors for drink; as small-beer acidulated with orange or lemon juice; whey turned with apples boiled in the milk, or with wine; emulsions made with barley-water and almonds; Moselle or Rhenish wine plentifully diluted with water; or any other things of this kind.

When this sort of diet did not keep the body open, the Arabian physicians added manna to it; but this they did sparingly, and with caution. "For it is quite necessary," says Avicen, "that the body be open in the beginning *." Which is one of the most important advices that can be given in this disease, if to it be added, that urine must be made plentifully. For there is a wonderful correspondence between the skin and the kidneys; whereby, whatever fluid is wont to be secreted by the cuticular glands, may with great ease be evacuated by the urinary passages. Wherefore it is very proper to draw off as much of the matter of the disease as can be done, by these passages, in order to prevent the overloading of the internal parts.

Now let us pass on to medicines; and, in the first place, blood-letting is necessary. But as dissensions frequently arise on this subject, some rules are to be laid down concerning it.

It is agreed on all hands, that this remedy is not very suitable to the tenderest age. But yet, as the

* De variolis & morbillis.

blood of infants is generally too thick, and too much in quantity for the bulk of the body; and as they are oft-times seized with convulsions, upon the appearance of the disease, some evacuation ought to be made: which may be safely effected by leeches applied to the temples, or behind the ears. Likewise, if blood cannot be drawn from the arm, in most young subjects either of the jugulars may be opened without inconvenience.

That regard is to be had to the patient's strength of what age soever, is manifest to all. But the weakness is seldom so great, as not to bear some loss of blood, unless it be after some extraordinary evacuations. Nor is the pulse to be overmuch depended on in this case: for it often happens, that the thickness of the blood prevents the secretion of the usual quantity of animal spirits in the brain, and that the vital fluid is not propelled from the heart with due force: in which case, by removing the oppression, the patient's strength is observed even to increase with the bleeding.

But in what proportion blood is to be taken away, will be best determined by the vehemence of the disease. Many of our physicians imagine that they have done their duty, when they have ordered one bleeding, and are vastly cautious of opening a vein at all, after the first appearance of the pustules, for fear of checking the eruption. But this is certainly an ill-timed caution: for in youths and adults it is often necessary to draw blood two or three times, only with an intermission of two or three days between each time. And indeed blood-letting is so far from being an obstacle to the eruption

of the pustules, if the patient be not too weak, that it forwards it considerably; and for the very same reason, that in large abscesses, when there is too great a fulness, and the heat too intense, the suppuration is brought on quicker and better by taking away some blood.

I have often observed, when in the beginning a vast number of small pustules foreboded a disease of the worse kind, that the face of affairs was so remarkably changed upon one or two bleedings, that the pustules increased in size, and diminished in number, (the greatness of the disease thus giving way to the greatness of the remedy), by which means nature acquired sufficient strength to expel the noxious humour. For it is most certainly true, that nature labours at the expulsion of the poison in the most perfect manner, that is, endeavours to make the pustules fill up as much as possible; and for that end she requires every thing to be quiet within the body, and always abhors confusion. And indeed, the reason why the confluent small-pox is worse than the distinct sort, is not, because the matter of the disease is more abundant in the former than in the latter, but because it is not pushed out in a proper manner. For upon a strict examination we generally find, that the greater quantity is discharged in the distinct sort.

Now, to conclude this head, such is the benefit of large and reiterated bleeding, that it is observed to prevent those evils which often attend the disease; as a delirium, convulsions, difficulty of breathing, and the like. For the dissection of dead bodies shews, that the infection is not confined to the external parts of the body, but seizes on the internal parts
also.

also. For I myself have seen subjects, in which the lungs, brain, liver, and intestines were thick beset with pustules. Nor have I the least doubt, but that those sudden deaths which sometimes happen towards the end of the disease, when there seemed to be no room left for fear, are occasioned by the efflux of the purulent matter from the bursted pustules on one or other of the nobler parts. Wherefore no fever is attended with more uncertain signs, on which to ground a sure prognostic, than this of which we are treating. Upon the whole, there is no time of the disease, wherein it may not be necessary to draw blood; if the violence of the fever require it, and the patient appear able to bear it. For it is always better to try a doubtful remedy than none.

A frenzy, coming on the fourth day of the eruption, is justly esteemed of very bad omen; insomuch that Dr Freind says, that he never saw a patient recover, who had had this symptom *. But I can positively declare, that I have had better fortune; having recovered many who had been seized with a delirium at that time, by drawing blood immediately, and then throwing in a clyster.

After taking away as much blood as is requisite, it is proper to purge the body; which may be done with safety enough, any time before the eruption of the pustules. But the purge must be of the gentle kind; such as the infusion of senna with manna, or manna alone, especially for children. For no disturbance is to be raised in the body. But first a vomit should be given, if there happens to be any collec-

* Epist. de quibusdam variolarum generibus.

tion of phlegm or bile in the stomach, or the stomach to be loaded with food unseasonably taken.

As soon as it is certain, that the eruption is near at hand, most physicians are of opinion, that it ought to be promoted, by all means. Yet we are to remember, that this is the proper work of nature; and therefore great care should be taken, neither to increase the motion of the blood over-much, nor suffer it to grow languid.

It was a wise saying of Asclepiades, that he made use of the fever for its own cure *: whereby he meant, that the fever is to be regulated in such a manner, that itself may throw off whatever is noxious to the body. Wherefore the true intention in this case, is, to keep the inflammation of the blood within due bounds, and at the same time to assist the expulsion of the morbid matter through the skin. For both which purposes a medicine, which I have experienced to be useful, is a powder composed of two parts of the bezoardic powder, and one part of purified nitre; and sometimes of equal parts of both. An adult may take half a drachm of this powder three or four times in a day, diminishing the quantity for children, in proportion to their age. And if the effervescence of the blood run very high, a proper quantity of spirit of vitriol may be added to the patient's drink. But if there be any heakings or retchings to vomit, they will be removed by draughts containing half an ounce of juice of lemons, with one scruple of salt of wormwood.

Now, concerning those medicines which ease pain, and procure sleep, in this severe disease, these are not

* Cels. lib. iii. cap. iv.

to be used over-hastily : for all anodynes in some measure obstruct the separation of the morbid humour from the blood, unless the pain happens to be excessive : and moreover, if the violence of the fever has raised a delirium, they generally make it worse. Wherefore it is not proper to employ them, until the eruption of the pustules be completed ; but after that narcotics may be administered with safety. Thus it will be right to give the patient a dose of the thebaic tincture, or diacodion, every evening, especially if he be a youth or an adult person ; for these medicines agree not so well with infants. And sometimes, in cases of very great inquietude, the dose is to be repeated in the morning. For the suppuration of the matter, stagnating in the pustules, is forwarded by quiet and sleep. But if, towards the end of the disease, the patient happens to be seized with a shortness of breath, or danger of choking from viscid slime, these medicines are to be entirely prohibited. In the mean time, if the patient is costive, which is generally the case, and the fever continues, the body is to be opened with a clyster every second or third day.

It may be needless to observe, that if this method is proper in the distinct small-pox, it will be found more necessary still in the confluent, which is attended with greater fear and danger.

From the simple I now pass to the malignant small-pox, of which I have already established three sorts, to wit, the crystalline, the warty, and the bloody.

Now, this observation holds good in all kinds of the disease, that the more the pustules tend to suppuration, the greater are the hopes of recovery ; and therefore, when that does not go on according to our wishes,

wishes, all possible means are to be employed to throw the morbidic humour on the skin; with which intention every thing is to be done in this case, which we have proposed in treating of the simple sort. But yet each species of the malignant sort requires a peculiar consideration.

Whereas, in the crystalline sort, the water of the pustules can never be brought to a laudable suppuration; it ought to be carried off by those passages in the body, which are naturally adapted to the secretion of the thinner fluids. Now, I have said above, that there is a great correspondence between the skin and the kidneys. Therefore, while the thinnest parts of this water are made to transpire through the skin, the grosser parts ought to be drawn off through the urinary passages, by diuretic medicines. Of this tribe there is nothing better than nitre, and that may be administered three or four times a-day, in such quantities as may not offend the stomach, to wit, a scruple or half a drachm, dissolved in small wine, which is the only sort that agrees with this disease till towards the end; when it may be proper to allow the patient a little Canary, (Dr Sydenham's favourite liquor), or any other soft and generous wine to support his strength. But while nitre is thus taken, it will be right to interpose those medicines which cherish the heart, and promote the flux of the humour into the pustules: such as Raleigh's cordial, or the cordial confection; the bezoardic powder, sometimes with a little saffron; and the plain spirit of hartshorn. Besides these, on the fifth or sixth day of the eruption, blisters are to be applied between the shoulders, and to the arms and legs: for which purpose, the blistering epithem is
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most convenient, as its soft consistence enables it to reach the skin between the pustules, and stick to it. For by this discharge of the serosities, the fever, which increases, when there is no farther derivation of humours to the skin, is seasonably prevented.

I know indeed, that most of our physicians apply this remedy earlier, and even on the first days of the disease, in every malignant small-pox; but there is just reason to fear, that the great commotion raised in the blood by the acrimony of the flies might be an obstacle to the due propulsion of the humour into the beginning pustules.

The warty small-pox is more dangerous than the crystalline; because the matter of the disease, being too thick, can neither suppurate, nor pass off by urine. Wherefore it is necessary to use the utmost endeavours to take off the fever, and to provoke sweat, in order to digest the morbid humour, by the cordial medicines aforementioned. And blisters ought to be applied in this case likewise. But the Arabian physicians pronounced this sort of the disease to be always fatal *.

Lastly, that sort which I have called the bloody small-pox, requires peculiar attention. Now, in this sort, if there is any room for physic, those medicines bid fairest for success, which, by their stypticity, thicken the blood in some measure, and so check it, that it cannot break through even the smallest arteries. The best of this kind are the Peruvian bark, alum, and that spirit which is called oil of vitriol. Now, these are to be used alternately in this manner. A drachm of the bark may be given every sixth hour;

* See Rhazes's treatise annexed, chap. viii.

and, three hours after, a proper quantity of alum. It will be a very powerful medicine, if thus compounded. Melt three parts of alum on the fire, with one part of that inspissated juice, which is improperly named *dragon's blood*: when the mass is grown cold, reduce it to a powder; a scruple of which, made into a bolus with conserve of red roses, will be a proper dose. The most convenient manner of giving the oil of vitriol, is in the tincture of roses; five or six spoonfuls whereof may be taken several times in the day. And besides, the patient's common drink may be acidulated with it; especially if purple or black spots appear interspersed among the pustules. And this medicine will be of great service, not only in the bloody, but in all the other sorts likewise, accompanied with these spots. This one thing more I will add, that I have experienced the use of blisters to be safe enough in this case, when a delirium requires their application. I have indeed seen some patients recover by this method, who had discharged large quantities of blood by the urinary canal at the time of the eruption of the pustules; but it is worthy of notice, that, in all these, the disease terminated in some considerable evil. For they were tortured, either with boils breaking out in many parts of the body, or with glandular swellings under the ears or armpits, which were not easily brought to suppuration. I likewise remember the case of a young man, one of whose tonsils was destroyed by a gangrenous ulcer which was very troublesome to cure. Thus upon the whole it is manifest, that it is extremely difficult to clear the mass of blood of this poison; and that a perfect recovery is not to be procured without a suppuration,
either

either in its due course of time, or in the last stage of the distemper.

But in every sort of this disease, it is proper to open the body on the decline, that is, on the ninth or tenth day from the eruption ; because a putrid fever generally comes on about this time, while the pustules are drying ; or upon the subsidence of the swelling of the inflamed skin, where there is no suppuration ; which fever cannot be taken off with equal safety by any other means. But gentle cathartics alone are to be employed in this case, such as I have advised before the eruption of the pustules.

This whole affair I formerly explained and illustrated with proper examples, in my letter to Dr Freind * ; and that gentleman likewise abundantly confirmed it afterwards, by the authorities of ancient and modern physicians. So that whosoever refuses his assent to this practice, must resolve not to see at noon-day. All fevers have their certain periods ; and where the poisonous matter has once infected the humours, the putrid fuel of the disease can hardly be thrown out of the body early enough. And indeed, when this rule is not observed, we daily see the distemper followed immediately by a hectic fever, attended with a cough, spitting of purulent matter, shortness of breath, and other symptoms of the lungs being affected.

But I must observe in this place, that, however beneficial purging may be at this time ; yet, if the body happens to be too loose, either from the natural state of the intestines, or by frequent clysters, this

* Vid. Freind. commentar. vii. ad Hippocrat. de morbis popularibus. Et epist. de purgantibus in secunda variolarum febre adhibend.

remedy becomes less necessary, or at least may be postponed for some days. For great regard is to be paid to the patient's strength, which the length of the illness has more or less impaired.

Moreover, it is requisite to be very circumspect, whether there be any remains of the purulent matter lurking under the withered skin of the pustules; for this is sometimes so manifestly the case, that though the scabs appear dry and hard; yet, upon some of them breaking here and there, there issues forth very foetid matter. In this circumstance, the body is not to be purged, but rather to be supported by proper diet, until the matter is all come away; which I have seen continue running to the twenty-fourth day of the disease, and yet the patient recovered. I shall never forget the case of a certain young man of a very robust constitution, who had so dreadful a sort of the confluent small-pox, that when the pustules should have ripened, his whole face was become black and dry; and, in short, thoroughly mortified. As the case, seemed quite desperate, I ordered incisions to be made to the quick in many places, and fomentations of a decoction of emollient and warm plants, with the addition of camphorated spirit of wine, to be applied to the parts: whereupon there followed a discharge of matter from the incisions of so offensive a smell, that none of the attendants could bear to stay in the room; and having at the same time promoted this discharge by proper digestives, and duly purged him, he at length recovered. But his mangled face bore the lasting marks of the malignity of the distemper, and of the goodness of the cure.

In fine, it will be of use at this time to take away
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some blood, if the heat be too great, and the patient have strength enough left to bear it.

Whosoever thoroughly considers all the circumstances of this subject, which I have hitherto explained, must justly wonder how the learned Dr Boerhaave could be induced to hope, that some time or other a specific antidote may be found against this contagious poison *; that is, by which it may be so thoroughly destroyed, that though it had been received into the body, it may not produce the disease. But the principles and elements of things are so certain, and so well established by the permanent laws of nature, that whosoever would endeavour to change them, would act like those philosophers by fire, (as they style themselves), who labour hard to transmute the baser metals into gold; and when continual disappointments have convinced them of the vanity of their hopes, actually extract gold out of the purses of the ignorant and credulous, by the fumes of their charcoal.

This one observation I must add, that there is no species of fever, which requires the body to be thoroughly cleared of the remains of the disease, more than this. Wherefore, upon the patient's recovery, blood is to be drawn, if his strength will bear it; and cathartics are to be given several times at proper intervals. After which, the body is to be restored to its former state by a course of milk, especially that of asses, with suitable food, and the air and amusements of the country.

I shall close this long chapter with the account of a very malignant small-pox in a youth of fifteen years

* Aphor. de cognoscendis et curandis morbis, 1390. 1391, & 92.

of age, communicated to me by my son-in-law, the learned and ingenious Dr Wilmot; who, from the fifth day of the disease, attended the patient jointly with Dr Connel.

In the beginning of the fever preceding the eruption, the patient was directed to be let blood, and to take a vomit, and the next morning a gentle purge: the day following, the small-pox flushed out. The pustules were very numerous and small all over the body, looking more like a rank measles than the small-pox. As his fever ran very high, he was ordered draughts of Gascoign's powder with nitre, to be taken every six hours; and to drink plentifully of barley-water acidulated with spirit of vitriol.

On the fourth day of the eruption, as he was very delirious, in order to procure sleep, a paregoric of six drachms of diacodion was given him, which did not produce the effect.

The fifth day, there was not the least swelling of the face; his pulse was quick and full, his heat intense, and the delirium not abated. Wherefore he was ordered another bleeding; the nitrose draughts were continued, with the addition of five grains of myrrh to each; as likewise barley-water with spirit of vitriol, and the paregoric as before.

The seventh, the appearance of the disease was still the same, with the addition of an oppression of his breath, and a very troublesome dry cough. Diascordium was added to his nitrose draughts, and he was ordered a solution of gum ammoniac to be taken, a spoonful at a time, as occasion required; and the paregoric continued.

The eighth, he complained much of a most acute
pain

pain in his head; his shortness of breath and cough were increased, his pulse low, and there were no signs of suppuration; nor the least swelling in the face or hands: but the skin of his face looked like a piece of parchment. Blisters were ordered to be laid on his arms and legs, and plasters, made of equal parts of the cephalic and blistering plasters, to be wrapt round his feet: likewise draughts containing of mithridate half a drachm, and of volatile salt of amber half a scruple, to be taken every sixth hour; and a gargle of pectoral decoction, and oxymel of squills.

The tenth, as every thing was grown worse, besides continuing the same medicines, blisters were ordered below the elbows.

The eleventh, his pulse being much lower, and the patient much weaker, a mixture with Raleigh's confection was ordered to be taken often by spoonfuls, and the other cardiacs continued.

On the twelfth, the pulse being scarcely perceptible, and his breath oppressed to the last degree; when all hopes of success were given up, a fit of coughing, in which he was almost suffocated, brought on a spitting of a limpid, foetid humour, equal in quantity to a salivation raised by mercury. And this flux continued twelve days without any apparent abatement: from thence it gradually diminished for four days, when it stopped entirely.

By the sixteenth day, the disease, together with that discharge, had so far exhausted him, that he was scarce able to turn in his bed: and yet his spirits were so much better, that he could take plentifully of liquid nourishment. Whereby gathering strength, his fever had now the appearance of a hectic only;
for

for which he was ordered to lose five ounces of blood, to take draughts of lemon juice, and salt of wormwood, with a little sperma ceti dissolved in them, every four hours, and to drink asses milk every morning.

By this method, with the repetition of bleeding to five ounces two or three times, and now and then purging him gently with rhubarb ; together with elixir of vitriol in Bristol-water, and the country-air, he in time happily recovered.

In this case we have a most remarkable instance of what I have already said more than once, that is, how solicitous nature always is, at any rate to expel the poisonous matter of this disease out of the body.

C H A P. IV.

Of accidents in the small-pox.

MAny symptoms and circumstances attend the small-pox, which, as they neither commonly occur, nor seem to depend on the nature of the disease, either affright, or perplex the physician. Wherefore it may not be improper to make some remarks concerning them.

Sometimes the patient is seized with convulsions, just before the eruption. But this symptom is more terrifying than dangerous ; and in children particularly, those convulsions which frequently come on before the distemper appears, are generally rather a good, than a bad sign. Now in this case, though it may seem strange, blood-letting is to be carefully avoided ;

voided ; but a blister is to be applied to the neck, and to the soles of the feet plasters made of equal parts of the cephalic and blistering plasters : not forgetting at the same time to give those medicines inwardly, which experience has shewn to be antispasmodic. Of these the chief are, wild valerian root, Russian castor, and the spirits and volatile salts, chemically extracted from animals. For it has been frequently observed, that, upon drawing blood in this case, the disease ended fatally. I can assign no other reason for this event, but that those involuntary motions are occasioned by the patient's weakness ; which is so increased by that evacuation, that nature becomes incapable of throwing out the morbid matter upon the skin. But the thing is otherwise in adults, who, if not too weak, ought to lose a moderate quantity of blood, and then be put into the foregoing method.

The disease begins sometimes in a different, and almost contrary manner. For the eruption appears without much fever or pain ; for which reason there seems to be no danger. But that fond security is very frequently ill-grounded. For at the time when the pustules ought to tend to maturity, as if nature were lazy, and not attending to her duty, there is no suppuration made : hence the fever increases, with inquietude of body, anxiety of mind, difficulty of breathing, and a delirium ; which carry off the patient in a few days. In this state, the fever ought rather to be raised than checked ; and therefore warm medicines are to be directed, which promote suppuration, by increasing the motion of the blood, and thinning the humours : such are the Virginian snake-

snake-root, the contrayerva-root, saffron, asa foetida, myrrh, and the like. But above all, blisters must be laid on all the limbs. Such is the necessity of some evacuation or other in this disease, that if the matter of the infection be over-abundant, as it happens in bad cases, nature never fails endeavouring to throw off the load. Thus in adults a spitting comes on upon the first days of the eruption ; whereas children, who seldom spit, have a looseness almost through the whole disease. Both these evacuations are of great importance ; and therefore, as the looseness is not to be inconsiderately stopped in children ; so in adults, if the spitting does not go on to our wishes, it ought to be promoted by medicines, which stimulate the glands of the mouth ; especially gargles made of a decoction of mustard seed and pepper, with the addition of oxymel. For in the confluent and malignant small-pox, if this flux does not arise, and even continue to the end of the disease, it is a very bad sign.

Sometimes a suppression of urine makes the patient suffer great pain, receiving little or no relief from diuretics. In this case Dr Sydenham directed, that he should be taken out of bed, and exposed to the cool air : which generally has a good effect. But the most convenient method will be to open the body by a clyster, especially if, the pustules now appearing, there be any fear of taking cold ; and then to insist a little on diuretic medicines ; for which purpose Glauber's salt is particularly useful, as it is both laxative and diuretic.

Whenever a woman with child is seized with the small-pox, the physician may justly dread the consequences. For he has reason to fear a miscarriage, which

which exposes his patient to two sorts of danger, the one from the new fever, which attends that accident ; the other from the loss of blood, which may bring her very low. And therefore the farther she is advanced in her pregnancy, the greater risk she runs ; because the delivery of a large child causes a greater flooding than that of a small one. I can however assert from my own knowledge, that a certain woman was delivered of a son at the full time, while she was actually labouring under this disease ; and yet both the mother and the child did well ; but this is a case equally extraordinary and fortunate. But still a good deal depends on the time of the disease, when the abortion happens : because the weakness occasioned thereby is the more dangerous, the more nearly it coincides with the time of the ripening of the pustules. Wherefore, if the efflux be more than nature usually requires, those medicines are to be given, which I have proposed in the bloody small-pox.

Now, whereas these cases fall out various ways, and physicians have been divided in opinion concerning some of them ; it may not be improper to make some animadversions on them separately.

When a woman in the small-pox suffers abortion, the child most commonly comes into the world with the distemper on it ; but not always. The reason of this difference will easily be understood, by duly considering what I have already said concerning infection *, and comparing it with what I shall hereafter say concerning the inoculation of the small-pox †. Whereby it will plainly appear, that the seeds of the

* Chap. i. † Chap. v.

disease are subtil particles, exhaled from the pustules come to maturity; which do not produce the effect, till eight or nine days after their entrance into a sound body. Upon which account, when the child comes into the world, before matter is made in the pustules on the mother, it has no visible marks of the distemper. And thus it sometimes happens, that the small-pox, which the infant has contracted in the womb, breaks forth on the second, third, or any other day before the eighth from the delivery, whether the child be come to its full time or not; as will appear by the following case, which lately fell under my own observation.

A lady of quality was, in the seventh month of her pregnancy, seized with so malignant a sort of the confluent small-pox, that there was no appearance of any one favourable symptom. For she neither spit plentifully; nor did the swelling of the hands or feet come on, upon that of the face subsiding; nor, in fine, was she assisted by a flux of urine on the decline of the disease; but, on the contrary, her face was all covered with small pimples, which made little or no matter. In this condition, she was, on the eleventh day of the distemper, pretty easily delivered of a son, who brought no marks of the infection into the world; and she died on the fourteenth day. But in the morning of the fourth day following, the infant was seized with convulsions, the forerunners of the eruption, which appeared the same day, and he died in the evening. In this case it is plain, that some suppuration having been made, as usual, on the eleventh day, the distemper passed from the mother

to

to the child, which was not to break out till eight days after.

But in case there is no miscarriage, the child will be free from the disease during his whole life; unless he happens to be born before the pustules were come to maturity. For as something naturally inherent in our constitution renders the body liable to the infection; so, when this debt is once paid to nature, we are secure ever after. But the infant in the womb sometimes catches the distemper, without the mother being affected; as I shall prove by this remarkable instance, which I well remember. A certain woman, who had formerly had the small-pox, and was now near her reckoning, attended her husband in the distemper. She went her full time, and was delivered of a dead child. It may be needless to observe, that she did not catch it on this occasion: but the dead body of the infant was a horrid sight, being all over covered with the pustules; a manifest sign that it died of the disease, before it was brought into the world. Wherefore, upon the whole, let none entertain the least suspicion, that the same person can possibly have this distemper twice. But the reason why the body is liable to the infection once, and no more, is to me as entirely unknown, as to the most ignorant of mankind. But this I will add, that an infant in the womb may have the good luck to go through the disease, and yet the marks be quite effaced before the birth*.

From what we have said concerning abortions, it is easy to comprehend what judgment ought to be formed of the monthly evacuations coinciding with

* Vid. Mauriceau, sur la grossesse & l'accouchement des femmes, obs. 576.

the small-pox, a circumstance at which people are apt to be alarmed. For this evacuation is of the same kind with the flooding which follows upon abortion : and whether it happens at the usual time, or is brought on irregularly by the extraordinary effervescence of the blood ; in both cases, it rather affords relief than threatens danger. However, if in either case the discharge should prove so great, as to weaken the patient over-much ; it must be restrained by those medicines which I have recommended in the bloody small-pox, without neglecting to draw blood, if requisite. But we know by experience, that women have sometimes uterine discharges through the whole course of the disease, without loss of strength, or any other inconvenience.

The same judgment may be formed of hæmorrhages at the nose, which frequently occur in the beginning of the distemper ; for they are occasioned by the rarefaction of the blood in the small vessels ; and therefore, by diminishing the heat, are generally more serviceable than detrimental, unless they run to excess.

It happens sometimes, though not often, that the variolous fever is accompanied with a single or double tertian intermitting fever ; in which case, the Peruvian bark, or, which is more convenient, its extract, is to be given at proper distances of time, till the paroxysms cease to return. Nor is there any reason to fear, that this medicine will hinder the maturation of the pustules : on the contrary, as this new effervescence of the blood, and commotion of the humours, may easily prove an obstacle to the suppuration ; by checking these, all things proceed in their usual course. But first, the body is to be opened by a clyster. Now,
the

the case is much the same here with respect to this febrifuge, as in mortifications, in which it is known to be of signal service * : and it was from a reflection, that mortifications are always accompanied with a fever, that I have proposed the same medicine in the bloody small-pox, interspersed with black spots, or, in other words, with small gangrenes †.

Here it may not be improper to lay down one general rule, which is, that whatever acute disease comes upon the small-pox, requires to be treated with its own peculiar medicines, and generally bears them very well.

By this time I hope I have thrown sufficient light on the most material circumstances of this part of my subject. But before I close it, it seems well worthy of notice, that this disease is generally very mild, when it is contracted soon after some considerable evacuation, whether natural or artificial. Thus a woman in childbed has generally a kindly sort of the small-pox ; if she has recovered somewhat of strength, by the time she is seized with the distemper ; and therefore reaps benefit from her late sufferings. The same thing may be said of such as are newly recovered from some acute disease. And I have formerly seen many patients in the hospital, who, after salivation for the venereal disease, caught the small-pox, while they were yet vastly emaciated ; and all of them went through it with great safety ; a manifest proof, that any evacuation, by withdrawing fuel from the fire, agrees particularly well with this disease. Lastly, to all that I have hitherto said, this one remark more is

* Vid. medical essays, Edinb. vol. v. part 1. artic. 10.

† Chap. iii.

proper to be added. Though this be naturally a dreadful disease, yet it is sometimes found to produce very good consequences. For in constitutions, where the blood is vitiated, either from an original taint, or by the manner of living; and glandular tumours are occasioned by the viscidty of the lymph; the small-pox, by purifying the juices, contributes to a better state of health for the future.

C H A P. V.

Of the inoculation of the small-pox.

THE custom of inoculating, or transferring the small-pox from an infected person to one that is sound, has prevailed among us for some years. This matter has drawn our physicians into parties; some approving, and others disapproving this new practice. I shall therefore freely interpose my opinion in the case.

Our nature is so formed, that although we are always inclined to avoid whatsoever may be hurtful; yet, when any evil is to be undergone, which can only be suffered once, this we are impatient to go through, even with a certain boldness; with this view, that the remainder of life may be passed without the uneasiness which arises from the continual apprehension of its coming upon us.

It having therefore been found by experience, that nobody was seized with the small-pox a second time, and that scarce one in a thousand escaped having it once; men began to consult how the disease might be communicated; it manifestly appearing to be contagious,

tagious, and it was obvious to conjecture, that the seeds of that contagion lay hidden in the pustules.

But I have often wondered how such a notion could come into the heads of people almost quite ignorant of what relates to physic. For, as far as I have been able to find out by inquiry, this was the invention of the Circassians, the women of which country are said to excel in beauty ; upon which account, it is very common, especially among the poorer sort, to sell young girls for slaves to be carried away into the neighbouring parts. When therefore it was observed, that they who were seized with this distemper, were in less danger both of their beauty and their life, the younger they were ; they contrived this way of infecting the body, that so the merchandize might bring the greater profit. Neither did the thing require the assistance of a physician or surgeon. It was sufficient to make a small wound in the skin, in any part of the body, and put into it a very little of the matter taken out of the ripe pustules ; and this even the women had learned to practise * : in like manner as our artists now, making a very slight incision in each arm, and putting upon it a small thread of lint or cotton, imbibed with the corruption, very rarely frustrate the hopes of their desirous patients.

In process of time, not many years ago, this art began to be used at Constantinople and Smyrna ; not by the Turks, who imagining all things in life to come to pass by unavoidable fate, think it impious to oppose and resist it ; but among the Grecians, Armenians, and the people of other countries living there,

* See Philosophical Transactions, No 339. and 347-who

who gave the knowledge of it to our countrymen *.

But that I may omit nothing relating to this affair ; a learned † author has given an account, that the practice of sowing this disease, as they call it, has been known to the Chinese above these hundred years ; and that they do it in another manner, which is this. They take the skins of some of the dried pustules, which are fallen from the body, and put them into a porcelain bottle, stopping the mouth of it very close with wax. When they have a mind to infect any one, they make up three or four of these skins, putting between them one grain of musk into a tent with cotton, which they put up the nostrils.

It was indeed not difficult for such ingenious people, when they saw those who were conversant with the sick, contract the same infection, to guess that the air, tainted with the foul breath of the diseased person did, when drawn in, corrupt one who was found ; and therefore they might rationally argue, that the same contagious matter might be taken in at the nostrils. Nor were they mistaken in this point.

It is however certain, (whatsoever the author of this narration, more skilled in theological than in medical learning, may say to the contrary), that this Chinese way of implanting the distemper is attended with much more danger than the Grecian one. For the morbid particles inspired violently offend the brain, by

* See Maitland's account of inoculating the small-pox, London, 1722 ; et *Dissertatio medica de Byzantina variolarum incisione*, auctore Le Duc. Lugd. Bat. 1722.

† Vid. *Lettres edifiantes & curieuses des missionnaires*, recueil xx. page 304.

reason of its nearness to the nerves which perform the office of smelling; and we have in another place proved, that contagion is propagated, not by the blood, but by the nervous liquor *.

I myself have had an opportunity of making an experiment to this purpose. For, when in the year 1721, by order of his Sacred Majesty, both for the sake of his own family, and of his subjects, a trial was to be made upon seven condemned malefactors, whether or not the small-pox could safely be communicated by inoculation; I easily obtained leave to make the Chinese experiment in one of them. There was among those who were chosen out to undergo the operation, a young girl of eighteen years of age; I put into her nostrils a tent, wetted with matter taken out of ripe pustules. The event answered: for she, in like manner with the others, who were infected by incisions made in the skin, fell sick, and recovered; but suffered much more than they did, being, immediately after the poison was received into the nose, miserably tormented with sharp pains in her head, and a fever, which never left her till the eruption of the pustules.

Since that time, this practice has been followed, without much fear, and indeed (as it usually happens in new experiments) sometimes with a degree of rashness; as promising a milder kind of small-pox, than when taken in the natural way. For, by † the accounts

* Introduction to the mechanical account of poisons.

† See Dr Jurin's letter to Dr Cotesworth, containing a comparison between the mortality of the natural small-pox, and that by inoculation; and His account of the success of inoculation in the years 1724, 25, and 26.

collected by those who have inquired into the affair, it is plain, that scarce one in a hundred dies by the inoculated small-pox; whereas many more in proportion are destroyed by the ordinary disease.

A remarkable instance of this difference, and with what security this transplanting the distemper may be made, is given in the following relation, communicated to me by a gentleman of great credit. He was a merchant at St Christopher's, in the West Indies, and in the making of sugar (which is the trade of that place) employed a great number of slaves. In one year, when the small-pox raged with more than ordinary violence in the neighbouring islands, with his own hands, he inoculated three hundred of them, from five to thirty years of age, with such success, that not one of them died, though most of them were negroes. And whereas all the Americans suffer this distemper in a most terrible manner; yet experience shews, that it is much more dangerous, when it attacks the natives of Africa.

Things being thus, it may be proper to consider, whether any reasons can be alleged to the contrary. And, in the first place, there are some who insist upon it, that the eruptions produced by inoculation are not the genuine small-pox, and consequently that they cannot secure any one from having the disease hereafter. Moreover, they take pains to bring testimonies of patients, who, after having undergone the artificial distemper, have nevertheless been afterwards seized with the true one.

Now, I own, I cannot understand how contagion, that is, the very seed of the disease, should produce, not its own proper distemper, but another of a quite different

different kind. Neither certainly does it matter, by which way the infection is received, provided it brings forth manifest marks of the disease. And as to those, who, after having been inoculated with success, are, notwithstanding this, said to have suffered the small-pox; I must protest, that, after the most diligent inquiry, I have not been able to find out one convincing proof of this kind. I very well know, that a story is spread abroad, particularly by a late author, of a boy, upon whom, about three years after he had contracted the disease by inoculation, it broke out again. But I am well assured, that this narration is of doubtful credit; and that there were some of the family, who affirmed, that no small-pox appeared upon the inoculation; that the parents (as we easily believe what we wish) deceived themselves, and that the by-standers did not care to take away from them this pleasing mistake.

But to speak plainly, if such a thing happened once, why do we not see it come to pass oftener? Or what can a single example, supposing it to be true and certain, avail, when innumerable experiments have produced nothing like it? However, some men are infected with an incurable itch of writing, and take great pleasure in contradicting others, to whom they bear envy. Let us therefore give them leave to applaud themselves, and enjoy their own vain-glory.

But they will still go on to terrify us, by saying, that there is danger lest, together with the small-pox, some other infectious disease, inherent in the blood and humours of the sick person, should be transmitted into the sound body; all contagion being very

subtile, and wonderfully active. And it is indeed not improbable, that some other distemper, besides those which are cutaneous, may, by such a way as this, get admittance into the skin; and such perhaps are scrophulous swellings, and the venereal disease. Yet I can hardly believe, that it ever happens, that the seed of one distemper should bring along with it mixed, the procreative matter of another, of a nature quite different from it. However it be, it would be madness in a physician, without any choice, to take the morbid matter for this purpose, out of sick bodies, without distinction. The most proper subjects are infants or children, sound in all other respects, as far as can be judged, and born of healthy parents. Besides, it is, in my opinion, more material, into what kind of a body the venom be infused, than out of what it be taken. And this I the rather mention, because I have more than once known rash and unwary surgeons to implant the disease into bodies weak, and of an ill habit, with a fatal event. Lastly, it is of very great consequence to take care not to throw a new infection into one already infected: for I have observed this to prove mortal; nature being oppressed and sinking under a double disease, when perhaps she might have got the better of either of them single.

I have often considered for what reasons it is, that the inoculated is safer than the natural small-pox; and the following seem to be the chief. First, the venom is communicated to a young, healthy, and, for the age, strong body. In the next place, the violence of the fever, which follows, is prevented, if there be occasion, by bleeding, and gentle purging. And lastly,

lastly, through the whole time that the contagious matter is exerting its malignity upon the humours (which is generally eight or nine days), quietness, moderation in diet, and every thing else is strictly observed: whereas, many incur the natural distemper on a sudden, when the blood is heated with wine and exercise; by which means, all the symptoms must necessarily prove more severe and dangerous. Some have also been of opinion, that the discharge out of the wound made to introduce the purulent matter, and likewise from the small pimples which break out round it, may contribute something to the safety of the patient. But the small quantity which runs out this way cannot, I think, avail much. Two blisters laid, one to an arm, the other to a leg, will certainly do much more; especially if they be kept running throughout the whole course of the disease. And I make no question, but this practice would be of very great service.

It is proper to mention, that this artificial disease is usually so mild, that it scarce requires any help from medicines. But where it happens otherwise, as it sometimes does, the same will be necessary, which have been directed in the several kinds of the natural small-pox.

To conclude; it ought not to be omitted, that boils, and swellings under the ears, and in the arm-pits, arise more frequently after the distemper procured by art, than after that which comes of its own accord; for this reason, as I suppose, that the venomous matter is pushed forward with less force, which disadvantage nature makes amends for this way.

Therefore, all possible means are to be used to
ripen

ripen such tumours, of whatever kind they are : if this cannot be done, they must be opened by incision ; and when all the matter is drawn out, the body must be purged by proper medicines, which are to be oftener repeated in this, than in the natural disease.

C H A P. VI.

Of the measles.

THE measles have a great affinity with the small-pox ; being originally bred in the same country, propagated in the same manner, by infection, into distant parts of the world, and never seizing any person more than once.

The history of this disease, as it generally appears among us, Dr Sydenham has described with his usual accuracy, calling it a fever, which in its nature and method of cure agrees very much with the small-pox ; that is, accompanied with a great inflammation, and in which pustules of a particular kind are thrown out upon the skin.

Now, this inflammation does not only affect the surface of the body, but the inner parts also, and particularly the lungs : hence follows a cough, with a difficulty of breathing. And although the distemper in its nature be less dangerous than the small-pox, and continues a shorter time ; for it usually is ended in six or seven days, or, at the farthest, in eight, very thin, and light scales, like fine flower, falling off from the skin at that time ; yet it seizes with more violent heat,

heat, and greater anxiety than the other does. Therefore Rhazes observed, that the inflammation of the whole body, the inquietude, and anxiety of mind, are much more terrible in the measles, than in the small-pox *.

I have therefore often wondered, why that sagacious and experienced physician, whom I have so often mentioned with praise, did not prescribe bleeding in the very beginning of the disease; but neglected this material part of the cure so far, that he only ordered it at the end, when a hot regimen, and too warm medicines, had brought upon the patient a cough and shortness of breath. Especially since he himself takes notice, that the looseness, which often follows this fever, and which, he says, proceeds from hot vapours from the inflamed blood falling upon the bowels, is only to be cured by blood-letting †. But the great man deserves pardon upon this account, that, in those times, physicians never attempted to take away blood in those fevers which were attended with any eruptions, particularly in children, who are the most liable to this kind of illness. Their reason was, lest that emptying of the vessels should hinder the coming out of what was to be discharged by the skin. But daily experience shews, that this fear is vain, and that the event is quite contrary to what they imagined.

To come therefore to the cure: As this pestilential disease is of kin to the small-pox, it requires a management not very different from the same, which we have recommended in that distemper. Blood must be taken away in the beginning, according to the age

* See his book, at the end of this, chap. i.

† De morbillis, cap. v. p. 207. edit. 1685.

and strength of the patient. It is best, if possible, to do this before the eruption of the pustules; but, if they are already come out, it must however be taken away. For the greatest danger is an inflammation of the lungs, which cannot be prevented too soon. Therefore in the height of the fever also, although bleeding was not neglected in the beginning, yet it is sometimes necessary to repeat it. And in the last place, at the end of the disease, when the skin is now growing dry, and the scales falling off, it will be a great error not to open a vein again; that, by this means, a flux of humours upon the breast and intestines, and the symptoms of a hectic fever and consumption, may be happily prevented.

It is really a thing to be grieved at, that physicians, in so great an inflammation of the whole surface of the body, should not always have directed this lessening the quantity, and thereby checking the heat of the blood. And I must of all wonder, that Dr Morton, who took notice of the necessity of this practice, when the disease was at the highest, should absolutely forbid it in its first appearance. But this physician's judgment was perverted by a vain, and not rightly understood, opinion of a malignity and venom infecting the animal spirits; which had so possessed his mind, that he thought of nothing more, than of throwing into the body hot medicines, called cordials, as auxiliary forces against the supposed enemy *. A bad example, and at the same time a convincing proof, how necessary it is, that a man should be instructed in the principles of mechanic philosophy, before he applies himself to the art of physic.

* De febribus inflammatoriis, cap. iv.

The diet ought to be the same as is prescribed in the small-pox ; taking particular care that the body be kept lax, rather than bound up, through the whole course of the distemper.

As to remedies ; to those cooling ones which are directed in the other disease, must be added such as abate the cough, and help expectoration ; particularly oily linctus and the pectoral infusion, of which, with the addition of a little nitre, the patient may drink frequently.

Dr Sydenham gave diacodion, even on the first days of the illness ; but I think he was not cautious enough in this point ; for all medicines of this kind thicken the humours, straiten the breath, and retard the eruption of the pustules. Therefore, during the increase of the distemper, they are to be used very sparingly ; but at the latter end they are of great service : inasmuch as there is then a necessity to quiet the cough, which, from the sharp defluxion upon the lungs, threatens a hectic fever and consumption. But in the mean time, gentle purges are to be given at due intervals. Milk, especially that of asses, must be drank. Change of air is also necessary. And lastly, exercise, suitable to the strength of the patient, is to be daily enjoined.

I am afraid, lest I should seem vainly to court applause by the following narration ; yet it is so much to the purpose, and so happily confirms what I have said, that I must beg leave to relate it. About forty years ago, the measles raged with so great violence in this city, that they proved more fatal than even the small-pox. At that time, a physician of great eminence came to me, desiring that I would inform

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him

him what method I followed in this disease. I asked him, whether or not he used to take away blood ? He answering no, because Sydenham very seldom did it ; I advised him to open a vein in the beginning of the distemper, or, if he was called in later, as soon however as he possibly could : for, said I, this disease always brings with it a peripneumony, which he very well knew ever required bleeding. Not long after, he met me again, returning me hearty thanks for my counsel, assuring me, that he had not lost one patient whom he had treated in this manner. Since that time, this practice grew so common, that it is now followed even by our apothecaries.

In the last place, it is proper to take notice, that, as was observed concerning the small-pox *, that the disease is more or less rife, according as the season of the year and state of the air conspire with the infection ; so the like happens in the measles. And Dr Morton relates, that, in the year 1672, this distemper was so terrible, that in London there died of it three hundred every week †.

But I have at last finished this little work ; which though it may perhaps, to contentious and malevolent persons, give matter for calumny and finding fault ; yet will, I hope, prove beneficial to mankind, especially to our own countrymen. This is all I desire ; for the consciousness of having done right is beyond all praise, carrying with it its own reward : and this he always enjoys, who consults the public good, and by his actions shews, that he thinks he is

Not for himself, but for the whole world born ‡.

* Chap. ii.
tis, pag. 427.

† Append. ad exer. de morbis acu-

‡ Non sibi, sed toti genitum se credere mundo. Lucan. l. ii. ver. 383.

RHAZES'S TREATISE on the SMALL-POX and MEASLES.

P R E F A C E.

In the name of God, merciful and gracious.

ABU-BEKER MOHAMMED, the son of Zacharias, saith thus :

On a certain night, at a meeting in the house of a nobleman, of great goodness and virtue, and very fond of the explanation of useful sciences, that they might be made plain and intelligible for the public benefit ; the conversation having turned on the small-pox, I then spoke what came into my mind on that subject. Which when that great man (whom may God long preserve for the good of mankind) had heard, he desired, that I would write a discourse on that disease with sufficient aptness, solidity, and clearness ; because there had never yet been published, either by the ancients or moderns, a satisfactory account of it.

I therefore composed this treatise, hoping to receive my reward from the almighty and glorious God, as the effect of his good-will.

Now, this is the sum of its contents, and the heads of the chapters.

C H A P. I.

Of the causes of the small-pox ; and how it comes to pass, that no mortal, except by chance here and there one, escapes free from this disease.

C H A P. II,

What bodies are most disposed to the small-pox ; also of the seasons of the year, in which they most frequently happen.

C H A P. III.

Of the prognostic signs of the eruption of the small-pox and measles,

C H A P. IV,

Of the regimen, or cure of the small-pox, in general.

C H A P. V.

Of preservation from the small-pox before the signs of them appear ; and the way to hinder the multiplying of them after the signs have appeared,

C H A P. VI,

Of those things which hasten the eruption of the small-pox : also how nature is to be assisted therein.

C H A P. VII.

Of taking care of the eyes, throat, ears, and joints,
as

as soon as the signs of the small-pox have appeared.

C H A P. VIII.

Of ripening the pustules.

C H A P. IX.

Of drying the pustules.

C H A P. X.

Of taking away the dry scabs of the small-pox, and the eschars from the eyes, and the rest of the body.

C H A P. XI.

Of destroying the marks of the small-pox.

C H A P. XII.

Of the food and diet in the small-pox.

C H A P. XIII.

Of managing the discharges of the belly, in the small-pox.

C H A P. XIV.

Of the curable and incurable small-pox and measles.

RHAZES'S

RHAZES'S TREATISE on the SMALL-POX and MEASLES.

C H A P. I.

Of the causes of the small-pox ; and how it comes to pass, that no mortal, except by chance here and there one, escapes from this disease : also a brief account of what Galen has mentioned concerning it.

AS to those physicians, who affirm, that the most excellent Galen has made no mention of the small-pox, and therefore that he did not know this distemper ; surely they have either never read his works at all, or only very cursorily ; nay, most of them do not know, whether what he plainly says of it, is to be understood of that disease. For Galen, in a certain treatise, says, this * * does good this and that way, and also against the small-pox. And in the beginning of the fourteenth book, *Of pulses*, that the blood is putrefied in an extraordinary degree, and that the inflammation runs so high, that it burns the skin ; so that the small-pox, and pestilent carbuncle, are bred in it, and quite consume it.

And in the ninth treatise of the book *Of the use of the parts*, he observes, that the superfluous parts of aliments, which are not turned into blood, and remain in the members, putrefy, and in time increasing do ferment ; whence, at last, are generated the pestilential carbuncle, the small-pox, and confluent inflammations.

Lastly, in the fourth part of his commentary upon

on the Timæus of Plato, he says, that the ancients gave the name *φλεγμονή* to every thing which produces redness, as the carbuncle, and small-pox ; and that these diseases are bred in those in whom bile abounds.

But as for those who allege, that he has proposed no remedy or cure, nor explained the nature of this distemper, they indeed say what is true : for he mentions no more than what we have cited. But God knows, whether he might not have done it in some other books, which have not yet appeared in Arabic.

As for my own part, I have with great diligence inquired of those who understand both the Syriac and Greek language, and desired them to inform me concerning this matter : but not one of them could tell me more than what I have set down. But this indeed I very much wonder at, and why he passed over this distemper in silence ; especially since it was frequent in his time, and therefore there was great reason for his prescribing remedies against it, as he was so diligent in finding out the causes and cures of diseases.

The moderns have, it is true, proposed some medicines for the cure of the small-pox, but not distinctly and clearly enough ; neither has any one of them explained the cause of it, and why, except here and there one, nobody escapes it ; nor shewed the methods of cure in a right order. Upon which account, I hope that the good man who encouraged me to undertake this work, will have his recompense ; and that my reward will be doubled, when I shall have described whatever is necessary to the cure of this disease in due method, assigning to every thing its proper place, by the help of God.

Wherefore

Wherefore let us begin to recite the efficient cause of this distemper ; and why it happens, that scarcely any one mortal escapes it. And then we will pursue separately, in the subsequent chapters, the other things which relate to it ; and, with God's assistance, shall say on each head whatever is necessary for its cure.

I say then *, that the body of man, from the time of his nativity, till he arrives at old age, continually tends to driness ; and that therefore the blood of infants and children, and, in proportion, the blood of young men, abounds much more with humidity, than the blood of old men, and is also hotter. And this indeed Galen teaches us, in his commentaries upon the aphorisms, where he says, the heat of children is indeed greater in quantity, than the heat of young men ; but the heat of young men is more violent in quality. This also is evident from the force of their natural actions, as the digestion of their food, and accretion in children.

Therefore, the blood of children may be compared to new wine, in which the fermentation leading to ripeness is not yet begun ; and the blood of young men to the same, fermenting and emitting steams, till it is quiet and ripe. And, lastly, the blood of old men is like to wine, whose strength is gone, so that it becomes vapid, and begins to grow sour.

Now, the small-pox arises, when the blood putrefies and ferments, and the fermenting particles are thrown out of it ; the blood of children, like to new wine, being changed to that of young men,

* Here begins the translation of the anonymous Greek interpreter.

which is as wine perfectly ripened. And this fermentation and ebullition is the disease.

And this is the reason why children, especially males, rarely escape being seized with it. For, without doubt, as the wine naturally ferments till it comes to perfection ; so the blood undergoes the same alteration, in passing from its first to its second state. And there seldom happens a temperament in an infant or child, in which such a change can be made in a small time, and without manifest signs of it : as may be judged from their diet, which in infants is milk ; and in children, not milky, but their food is stronger, in proportion, than that of other ages, and more compounded. To which it may be added, that in these there is, after food, a greater motion of the humours. For these reasons, very few children go into life without this distemper. Besides this, great alterations are made here, by different temperaments, manners of life, and habits ; as also by the constitution of the ambient air, and state of the blood, both as to quantity and quality : for in some this flows quicker, in others slower ; in some it abounds, in others it is deficient ; in some it is very bad, in others in a better condition.

As to young men, whereat the change in their blood is already made, its maturation finished, and the particles of moisture, which should cause putrefaction, are now exhaled ; hence it follows, that this disease cannot be generated in them, at least but very seldom, that is, in such whose blood still abounds with too much humidity, or is very corrupt, with a violent inflammation ; or who, perhaps, when they were children, had been attacked with the chicken-

pox, when their blood had not yet passed from the first state to the second ; or, lastly, who have a moderate heat, that is, without much moisture ; and when they had the chicken pox, were of a dry temperament, and lean.

In an advanced age, the distemper will scarcely appear, unless perhaps in putrid, malignant, and pestilential constitutions of the air, in which this disease chiefly rages. For such an air disposes bodies very much to heat and moisture ; and an inflamed air promotes eruptions, by blowing up the spirit in the ventricles of the heart, and communicating to it the like disposition, which, by the force of the heart, is sent into the blood, which is in the arteries ; and brings it into the same state of corruption.

Thus we have sufficiently, though succinctly, treated of the causes of the small-pox. We shall now proceed to shew, what bodies are most disposed to this disease and the measles.

C H A P. II.

Of bodies disposed to the small-pox.

BOdies inclined to this disease are generally such as are moist, pale, and fleshy ; the well-coloured also, especially, if they are ruddy and tending to brown, are disposed to it, if they are loaded with flesh. So are likewise those who are frequently liable to acute and continual fevers, to running of the eyes, red pimples, and boils, proceeding from the eating of sweet things ; as dates, honey, figs, grapes, and all those sweets in which there is a gross humour ;

mour ; particularly, thick gruels, food made of unground wheat, with honey and water, or a great quantity of wine and milk.

Lean, bilious, hot, and dry bodies are more inclinable to the measles, than to the small-pox. But if they happen to be taken with the small-pox, the pustules are either few, distinct, and favourable ; or, on the contrary, very bad, irregular, deceitful, dry, with putrefaction, and no maturation.

Lastly, thin, and dry bodies, of a cold temperament, are neither subject to the small-pox, nor to the measles. And if they happen to catch the small-pox, they have but few, in a moderate way, and without danger, with a very slight fever ; because such constitutions extinguish the disease in its very beginning.

The seasons of the year in which the small-pox are most frequent, are various : they rage most at the latter end of the autumn, and the beginning of the spring ; and when in the summer there are great and frequent rains, with continual south winds ; and lastly, when the winter is warm, and the winds southerly.

When the summer is excessively hot and dry, and succeeded by a hot autumn, in which rains come on very late ; then the measles quickly seize those who are disposed to them, that is, those who are lean, hot, and of bilious constitutions.

But all these things admit of great differences, by reason of the diversity of countries and places, and occult dispositions in the air, which bring on those distempers, and render bodies subject to them. And therefore, at such times, great diligence is to be used

in the preservation from them ; as we shall shew in the sequel.

C H A P. III.

Of the prognostic signs of the eruption of the small-pox and measles.

THE eruption of the small-pox is preceded by a continual fever, a pain in the back, itching in the nose, and terrors in sleep. These are the proper signs of the approaching small-pox, especially the pain in the back, with a fever ; and also a pricking, which the patient feels all over his body ; together with a fulness and redness of the face, which at times goes and comes : a redness of the eyes, a heaviness of the whole body ; frequent yawnings, a pain in the throat and breast, with a difficulty in breathing, and straitness in the gullet, then a dryness of the mouth, thick spittle, a hoarseness of the voice ; head-ach, anxiety of mind, inquietude ; sick qualms and heaviness of heart : with this difference, that anxiety of mind, sick qualms, and heaviness of heart, oppress more in the measles, than in the small-pox, unless the small-pox be of a bad sort ; for the measles are from a very bilious blood. And, on the other hand, the pain in the back, the heat and inflammation of the whole body, especially in the throat, with a shining redness, are more proper to the small-pox than to the measles.

Wherefore, upon the appearance of these signs, or some of the worst of them, you may be assured, that one or other of these diseases is nigh at hand.

As

As to the safer kind of the small-pox ; in these, the quantity of blood is greater than its bad quality : and hence arises the pain of the back ; the greater blood-vessels, which are situated near the vertebræ of the back, being distended with too great a quantity of blood.

C H A P. IV.

Of the regimen, or cure of the small-pox in general.

THE first article shall be of the preservation to be used, before the signs of the small-pox appear ; and after they have appeared, how the disease may be lessened.

The second, concerning the eruption.

The third, the care to be taken of the eyes, ears, nose, throat, and joints.

The fourth, of the ripening of the pustules.

The fifth, of their drying.

The sixth, how the scales and crusts are to be cleared from the eyes, and the rest of the body.

The seventh, of destroying the marks.

The eighth, of the diet in the small-pox.

The ninth, of regulating the discharge by the intestines.

The tenth, of curable and incurable small-pox and measles.

Of each of these I shall, God willing, briefly, but sufficiently discourse.

C H A P. V.

Of preservation from, and lessening the disease.

Blood ought to be taken away from children and young men, if they have never had the small-pox, or have only had what is called the chicken-pox, (especially at such seasons as we have above described), before they are seized with a fever, and the signs of the disease appear. A vein may be opened in those who are fourteen years old ; to those who are younger, cupping-glasses must be applied, and their lodgings should be kept cool.

Let their diet be yellow lentils, tarts made of unripe grapes, minced flesh-meat, dressed with vinegar and honey, or with the acid syrup ; to which raisins, a few figs, and chiches are sometimes added : also kid-broth, veal-jellies, and boiled woodcocks and hens. But these must be mixed with the juice of unripe grapes.

Their drink should be water cooled with snow, or clear spring water cold ; with which their chamber may also be sprinkled.

Let them frequently eat acid pomegranates, and the inspissated juices of acid and astringent fruits, as pomegranates, currants *, and the like.

Where the constitution is hot, and there is a great inflammation ; barley-water, with a fourth part of acid pomegranate juice, may be drank in the morning.

* The Arabic word is *Ribas*, which also signifies a sort of lapathum acetosum, or sorrel, of which the red and acid juice boiled to two thirds, is called *Rob de Ribes*. See Golii lexic.

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But if the heat be less, a ptisan of barley, with sugar, is proper ; and vinegar, lentils, pomegranates, and the juice of unripe grapes, may be added to the food ; for all these thicken and cool the blood, and make the distemper more mild

This regimen is of great service in all times of pestilence ; for it diminishes the malignity of pestilential ulcers and boils ; and prevents quinsies, pleurisies, and all distempers arising from bile and blood.

The patient may go into cold water, and swim in it about noon. He must abstain from new milk, wine, dates, honey, and, in general, from sweet things, and meats, made by a mixture of flesh, onions, oil, butter, and cheese ; from mutton, beef, shell-fish, high-seasoned things, and hot seeds. Instead of these, in times of contagion, he may eat young birds ; and if the temperament be hot and moist, liable to putrefaction, or hot and dry, and apt to be inflamed ; he must eat as follows ; that is, in the hot and dry constitution, cooling and moist garden-herbs, purslain, mallows, beet, gourds, cucumbers, forrel, and small pompions.

As to sweet melons, they are forbidden ; and if any one by chance eats of them, he must presently drink a spoonful of the juice of some of the acid fruits. He may be allowed soft fish, and butter-milk.

To the food of those who are corpulent, fleshy, and of a ruddy complexion, such cooling and drying things, as we have mentioned, may be added. They should all forbear labour, fatigue, bathing, venery, walking or riding in the sun and dust, drinking of stagnating waters, blasted fruits, or mouldy herbs ; and also figs and grapes : because these drive the hu-

mours

mours to the skin, and, filling the blood with flatulent spirits, dispose it more to fermentation and ebullition. Their body must be opened, if there be occasion, with the juice of prunes and sugar, or with whey and sugar. If the air be putrid and pestilential, their face may be continually sprinkled with the water of sanders and camphire; which, if it pleases God, will have a good effect.

As to sucking infants; if they are fat and ruddy, and above five months old, let them be cupped; and let the nurse, as far as possible, be managed in the manner we have mentioned.

I come now to those medicines which thicken and cool the blood, and check its ebullition and putrefaction.

All acid things are proper for this purpose, especially the water called *al-râib*, that is, the sour, bitter water, which swims upon butter-milk exposed to the sun; and the acid juice of citrons.

The same intention is very well answered by many things, which have an astringency joined with their acidity, and thereby condense the blood. Such are, four grapes, sumac, rob ribas, or the inspissated juice of currants, apples, quinces, and pomegranates; jujubes, lentils, coleworts, coriander, lettuce, poppies, endive, night-shade, sugar called *bambu* *, the seeds of fleawort, and camphire.

The following composition is good to cool the blood, and restrain the heat of the liver, and effervescence of the bile.

Take of red roses beaten, ten drachms; bambu-su-

* The Indian name for a concreted juice, like sugar, in an Indian reed.

gar,

gar, twenty drachms ; fumack, the seeds of wild forrel, lentils peeled, barberries, the seeds of purslain, seeds of white lettuce, of each five drachms ; red sanders, two drachms and a half ; camphire, one drachm.

Let these be mixed, and give three drachms of this powder to the patient every morning in his drink, together with an ounce of the juice of wild forrel, or of ribas, pomegranate, or unripe grapes, and the like.

The medicine al-facangjabin, that is, oxymel with sugar, is likewise good, which is thus prepared.

Take one part of red, sharp vinegar, depurated ; two parts of rose-water ; mix, and infuse in the cold mixture, one ounce of red roses ; half an ounce of balaustines ; two ounces of pomegranate-peel, for the space of three days. Then strain the liquor, adding to it, according to the quantity of the vinegar, twice or thrice as much of the sugar tabar zad, that is, white sugar-candy. Boil it sufficiently, and use it.

It will also be of use to take of roses and bambu-sugar, of each ten drachms ; white sanders, three drachms ; camphire, one drachm ; and moisten them with the mucilage of the seeds of fleawort ; then make the mass into pills, or troches. Of these, at proper times, three drachms may be given in the patient's drink, together with one ounce of the aforesaid al-facangjabin.

Besides these, the following syrup is excellent, and wonderfully exceeds in virtue all others, which I have seen tried ; though perhaps the syrup of pearls, which the Indians describe, and of which they boast more than they can have experienced, may be more powerful. For they say, that if any one drinks of that

syrup, though nine pustules have already appeared, there will not come out a tenth.

Now, the composition of mine is this.

Take of red vinegar depurated, old, and sharp, three pounds ; of the juice of acid pomegranates, the acid juice of citrons, the juice of unripe grapes, of ribas, of the Syrian mulberries, the expression of Syrian sumack, and barberries, of each one pound ; the juices of lettuce and tarragon, of each a quarter of a pound ; of the decoction of red jujubes, and the infusion of lentils, each a pound and half. Mix all together, and add three pounds of sugar ; boil the whole, and put to it some of the syrup already made, hot, working it with a pestle, till it is dissolved : then mix it with the whole, stirring it continually with a stick of camphire wood ; throw it into a mortar of stone, or willow-tree wood, taking out the clearest part all the while ; having added and mixed bambu-sugar and camphire. Use this before the small-pox appears, and also after the appearance, as we shall direct anon. It is also proper in all distempers, which arise from a bilious blood, in pestilential ulcers, boils, quinseys, and the like.

What I have said may in general suffice concerning preservation from the small-pox, before the fever, which attends their signs, comes on.

The last mentioned syrup repels the disease from one, who is in such a condition, that it can be repelled ; so that what comes out will be very moderate. It also effects, that the change of the blood from the first state to the second, should not be done too hastily, and at once, with too great ebullition, and frightful and dangerous symptoms ; but by degrees,

grees, and in a longer time ; in the way of maturation, not putrefaction, without terrible and dangerous fevers.

But when the fever, which accompanies the eruption, arises, this regimen is no longer to be used, unless with great caution and prudence ; for a mistake here is very dangerous, for this reason, that while the blood is rarefied, and nature, according to the temperament of the patient, is endeavouring to expel the morbid matter ; if then the refrigeration and condensation, which you intend, does not exceed the cool state the patient was in before, it will happen, that the ebullition will break out a second or third time ; and thus nature will be disturbed in her work. Neither can that ebullition be checked, without great danger : for those remedies must be used for this purpose, which do in a manner congeal and coagulate the blood ; such are, opium, hemlock, a great quantity of juice of lettuce, night-shade, and the like. And the congelation of the blood, and extinction of natural heat, by all these, is not safe ; because of the excess, which is easily committed : for it will be hard, at the same time to repress the effervescence, and preserve the due natural heat. In one word, care must be taken, not to extinguish preternatural and natural heat together.

Now I shall communicate a practice, which physicians, either through ignorance or avarice, that they only may receive profit from it, usually conceal ; and it is this. When you observe, upon the signs of the disease, a distension of the belly, pain in the back, redness of the face and eyes, a violent headach, with a full pulse, and also a straitness of breath, a red and

turbid urine, and such a heat of the body, as a man feels, who has been for some time in a hot bath ; especially, if the body be fleshy ; there is then all the reason in the world to take away blood. Wherefore, draw away a good quantity, even till the patient faints away. It will be best to do it from the basilic vein, or some of its branches ; but if that cannot be found, from the cephalic vein. Sometimes, when the basilic does not appear, it may be taken away from the vein in the ankle ; but better from the basilic or its branches, because they draw from the greater veins in the abdomen more than the cephalic does.

If the symptoms do not run very high, although they are manifest, draw blood but sparingly ; and when they are less, take away very little. Then proceed in the cure with repelling medicines, as has been mentioned.

If by these the feverish heat is removed, and the pulse and breath are come to their natural state ; still insist on the use of them, till the heat of the disease is perfectly abated, which will be done in a short time.

In order more effectually to perform this extinction, let the patient drink water, made cold in snow to the highest degree, very plentifully and often ; so that he may feel the coldness of it in his bowels. If, after this, the fever and burning return, give this water, a second time, two or three pints, or more, in the space of half an hour.

If still the heat return, and the belly be full of water, make him vomit it up, and then give it again. And if the water finds a passage, either by sweats or urine, you may be assured the patient is in a good way.

But

But if the water does not pass, and the heat returns as it was at first, or even is more violent; omit giving the water so often, and have recourse to the other extingvents, which have been described; and if the patient finds relief, persist in the use of them. If, on the contrary, you perceive, that they produce an intolerable uneasiness and inquietude, you may certainly know, that the eruption of the small-pox or measles is at hand. Wherefore you must quit this method, and hasten to assist nature, in expelling her superfluities in the manner I shall deliver in the following chapter.

C H A P. VI.

Of those things which hasten the eruption of the small-pox.

THE eruption of the small-pox and measles is promoted by the following means. The patient must be well wrapped up in cloaths, and his body rubbed all over. He must be kept in a room not very cold; he should drink frequently, a little at a time, of cold water, to provoke sweat, and assist the protrusion of the humours to the external parts.

The sick person must put on a double shirt, the borders of which must be bound. Underneath him, place two small basins of very hot water, one before, and the other behind him; so that the vapour may come to the whole body, except the face; by which means the skin will be rarefied, and disposed to receive the erumpent humour. For the surface of the body may, in this case, be compared to a leech, which, to
cool

cool its own heat, attracts whatsoever it can. And by this management, not only is the skin softened, but the strength of the patient is also preserved : so that nothing can be more proper.

As to furnaces and baths, they are both destructive at this time, by so overheating and weakening, that a swooning follows ; by which nature is diverted from its work with great danger, if the fit be violent and long : for nothing is a greater indication of the approach of death, the natural heat retiring into the inner parts ; after which it will be soon oppressed and extinguished by the over-abounding humours. Likewise, when the hot vapour, which I have directed, is used, it must never be suffered to cool upon the body ; but is presently to be wiped and dried off, with great diligence. This method is abundantly sufficient to forward the coming out of the disease, when nature is not languid, or the humours too thick and viscid.

But in case it happens, that the outward fever is indeed mild, but anxiety and inquietude continue, and the eruption is difficult ; you must wait till the fifth day is over, and then use those medicines which promote the eruption. But this is to be done with great caution, and all manner of attention, in the way which I have mentioned, when speaking of the rules to be observed in giving extinguishing remedies : for an error here, although it be not so great as the other, yet is also dangerous. And the caution consists in not being too hasty in giving these medicines, but to insist upon the former regimen, as long as there is any prospect of success without them ; and as long as you are not yet certain, that the fever is too re-

miss

mils in the inward parts, as well as it is in the outward. This you will easily know, by the pulse and respiration not being too quick, full, or irregular ; and if, in feeling the breast, you do not find it hot in the highest degree. For though the fever be doubly or trebly increased, it will not therefore be mortal ; as you may judge by comparing this with other fevers, which you have observed in persons of the same temperament, and in the same degree of heat with your patient, who nevertheless have recovered.

These extinguishing remedies are also to be applied when, as soon as the pustules appear in the skin, the patient feels himself to be pretty well, and his pulse and breath are easy. But if, on the other hand, the eruption goes on slowly and with difficulty, they must be absolutely forborn : for to use them, is to strive against nature, and check the protrusion. And when any anxiety follows upon the use of extingvents, especially a palpitation of the heart, be sure that you have committed a great error. You must therefore immediately take all possible pains in softening the skin, in the manner I have taught ; and give to drink frequently warm water, either alone, or in which fennel and smallage seeds have been first boiled, and the like simples which conduce to the eruption ; according as the heat of the patient and his stomach will bear them ; regard also being had to the slowness of the pimples in coming out.

This is the description of an essay, gentle medicine, which, without too much heat, promotes the eruption.

Take yellow figs to the number of thirty ; raisins,
the

the stones being taken out, twenty drachms ; pour upon them three pints of water, and let them boil till they are dissolved. Give to the patient of this liquor half a pint, at three several times. Then cover him up well in cloaths, and foment the body, as is above directed.

The following is yet more powerful.

Take of the aforesaid decoction four ounces ; of the decoction of fennel and smallage seeds, two ounces ; let the patient drink it, as has been directed.

One still more efficacious is this.

Boil fennel-seeds and smallage-seeds, of each ten drachms, in an earthen vessel, till the water is red ; strain it, and give three ounces at a time.

Lastly, this composition is very good and useful, at several times.

Take of red roses four drachms ; of lentils decorated nine drachms ; yellow figs ten ; of gum tragacanth three drachms ; of white raisins stoned, ten drachms ; lack, cleared from its sticks and washed, three drachms ; fennel and smallage seeds, of each five drachms. Boil all these in three pints of water, to one pint : strain the liquor, and give half a pint of it, with a sixth part of a drachm of saffron, twice or thrice, as there may be occasion.

We shall now speak of those parts of the body of which care is to be taken.

C H A P. VII.

Of taking care of the throat, eyes, &c. as soon as the pustules have appeared.

AS soon as ever the signs of the small-pox appear, particular care must be taken of the eyes, the throat, the nose, and ears, and also of the limbs, in the way I am going to describe. Nay, sometimes it will be necessary to extend our care even to the soles of the feet, and the palms of the hands: for oftentimes violent pains arise in these parts, the hardness of the skin hindering the eruption.

Upon the first appearance of the signs, drop rose-water into the eyes now and then; also wash the face with cold water often in a day, and sprinkle the eyes with the same. For if the disease be mild, this method will prevent the pustules breaking out in them. This indeed is to be done, for greater caution; for in the mild sort, it seldom happens, that any pustules break out on the eyes. But in a bad sort, when you see a large eruption in the beginning, with an itching of the eye-lids, and redness of the white of the eyes, some places of which are redder than others; you may be assured that the small-pox will break out there, unless great help be given: therefore immediately drop rose-water, in which sumack has been infused, into the eyes, several times in the day.

It will be still more effectual to apply a collyrium, made of galls in rose-water, by dropping it into the eyes; or to instil into the eyes what is squeezed from the pulp and skins of the four pomegranate, first

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chewed.

chewed. Then wash the eyelids with a collyrium, made of the water of quinces, the juice of unripe grapes, boxthorn, aloe, and acacia: of each of these let there be one part, and a tenth part of saffron; and drop some of it into the eyes.

But if you observe a turgescence in the humours, and the eruption to be very copious, so that pustules will certainly fall upon the eyes, because redness appears here and there in their white part, from the excess of the inflammation; and also find, that what you have applied does not remove that redness, but only lessen it for a time; after which it returns more violently than before, or at least continues as it was, when you began this treatment, you must not proceed any longer in this method, but, instead of these things, drop into the eyes some of the acid liquor expressed from mouldy bread, with the Nabathæan bitter, in which there is no vinegar, or other acid.

As to the pustules which break out in the tunica cornea of the eye, these darken the sight, and are to be cured, according to the degree of their thickness, by such dissolving remedies as I am going to describe: which indeed are sometimes effectual, and sometimes not; the success depending upon the matter being more or less thick, and upon the greater or less firmness and driness of the body.

But if large pustules shew themselves in the tunica uvea, use the collyrium of rose water several times in the day and night with great diligence; or else that before mentioned, leaving out the saffron; instead of which, put a small quantity of blood-stone, to keep down the swelling.

These things are what ought to be known concerning

ing the eyes. Care is next to be taken of the throat and mouth, lest any eruption there should grieve the patient, and hinder his breathing; for it often happens, that, in a bad kind of the disease, terrible suffocations are brought on, which leave no hopes of a recovery.

Therefore, on the first appearance of the signs of the small-pox, let the mouth be gargled with the water of acid pomegranates, or of sumack, or with the juice of mulberries, or with some of those things which we have recommended, (chap. V.), under the head of extinguent remedies; or lastly, if nothing else be ready at hand, with pure cold water; and that very often, to prevent a great eruption into the throat and mouth, and strengthen those parts, or at least hinder what is already broken out there from causing a suffocation. Be quick therefore, and diligent in applying this cure, especially, if from a hoarseness of voice, straitness in breathing, and a pain in the throat, a necessity of it shall appear.

Moreover, if the strength will bear it, take away blood from the cephalic vein; and that even after the whole eruption is over. And if the patient find any thing in his mouth, or throat, which hurts him; and yet there is not too great a heat there, neither are his bowels too loose, let him lick by degrees of fresh butter mixed with white sugar-candy. But if there be any heat and inflammation there, give a linctus of this kind.

Take of sweet almonds decorticated one part; of the seeds of gourd two parts; of white sugar-candy three parts; the mucilages of the seeds of fleawort, and of laurel-berries; a linctus of gum-arabic, al-

monds peeled, and the seeds of the plane-tree, and wheat-flower : mix all these with a mucilage of quince-seeds.

In the next place, let us take care of the limbs ; for upon these a number of very bad pustules often arise, which corrupt them to such a degree, that the muscles, tendons, nerves, and the bones themselves lie bare. Assist therefore immediately, if you observe the signs of the disease to be violent and excessive ; that is, bathe the limbs with sanders, quince-water, Armenian bole, roses, camphire, vinegar, and rose-water : but take care not to overdo it. If the pustules are very large, open them with an incision-knife, to let out the matter : and delay not this operation ; for the case is dangerous.

Now let us come to the cure of the nose and ears, lest they should be over-filled with the pimples : for this will greatly afflict the patient ; and when they break out in the internal part of the ear, there is danger of their coming presently into the nose. Take therefore a cotton cloth, upon which camphire has been broken ; by the help of this, put into the ear fragrant wine-vinegar, to which has been added quince-water, or the juice of boxthorn. Do this in the morning, and repeat it twice or thrice a-day.

Lastly, if a great pain arises in the soles of the feet, prepare instantly to anoint them with warm oil, and foment them with warm water and cotton. If this does not assuage the pain, nor facilitate the eruption, beat up decorticated sesam with milk ; anoint with it, and bind it on with cloths, and leave it upon the part all night. In the morning, put the foot into warm water ; and repeat the same again.

Or,

Or bruise dates with butter, and apply them ; or, lastly, anoint with the lees of the sesamine-oil. For these and the like things soften and relax the skin ; and by this means diminish the pain, and promote the eruption.

C H A P. VIII.

Of ripening the small-pox.

WHen, after the eruption is completed, you observe the pustules tend too slowly to maturity, and yet that the patient is otherwise in a very good way, as to his respiration and pulse, and pretty free from inquietude and anxiety ; then it behoves you to assist the maturation of the pustules.

But if, together with a backwardness of ripening after the eruption, you perceive the pustules to become hard and warty, and the patient not at all better ; or if his illness increases ; then you are to know that the small-pox is mortal. Wherefore have no thoughts of ripening the pustules ; for they are of that kind which cannot be ripened.

Now, the maturation of the small-pox, if curable, is to be effected by fomenting the body with the steam of a hot decoction in water of camomile, violets, melilot, marsh-mallows, and bran, either separate, or collected together in two basins ; as we have directed above, where we treated of facilitating the eruption.

And if then the patient seems to find relief and refreshment by the fomentation, you are to abstain from those fumigations which are commonly employed
for

for drying up the pustules ; until they ripen of themselves, and are capable of bearing those things which contribute towards drying them up : of which we are now going to treat.

C H A P. IX.

Of drying the pustules.

IF the pustules are large and very numerous, they must be dried ; or the fluid contained in them must be soaked up with fine clean cotton, in which there is nothing that may hurt the patient. And then let fumigations be made with the leaves of dried roses, or with the leaves of the storax-tree, or with sanders, or with the leaves of the iris, or the tamarisk : and indeed roses are more convenient in summer, but tamarisks in winter.

The small-pox sometimes abounds with too much moisture. When that happens, order the patient to lie on pounded roses, or on rice-meal, or on millet-meal, with which a mattress of a thin texture is stuffed.

If the body be full of pustules, lay moist leaves of the iris under the patient ; and besprinkle him with an aromatic powder made of aloe, frankincense, sarcocol, and dragon's blood.

But if the pustules break spontaneously, or from the quantity of the fluid contained in them, and are slow in drying, treat them in this manner.

Take of sesamine-oil one ounce ; of Andarene * salt

* Andar is a village, a mile distant from Aleppo, where a very white fossil salt is found. See Maundrell's journey.

pounded

pounded fine, and of alum, each two drachms. With this liniment anoint the body, carefully avoiding those places which are ulcerated or excoriated, or even too near an approach to them ; because the medicine would raise a violent inflammation. Let the liniment lie on the parts for the space of an hour ; then wash it off with a decoction in water of emblic myrobalans, white tamarisk-berries, myrtle-leaves, and pomegranate-peels.

If the pustules are dried by these means, it is well ; if not, take the whitest sort of bole (not the red bole), add to it of Andarene salt, and of dry bread crumbled fine, each a tenth part. Make a liniment, with which rub the skin ; let it lie on for an hour or two, and then wash it off.

Now we are to treat of taking off the dried scales, and crusts, or eschars.

C H A P. X.

Of taking away the dry scabs and eschars.

WHen the small-pox is withered, and the dry scales and eschars still remain on the skin, examine them well ; and to those that are small, and thoroughly dried up, apply warm sesamine-oil every now and then, till they are softened, and fall off : but those of the face are to be managed with oil of pistaches. For the larger sort, which resemble eschars, if you find any moisture remaining in them, cut them off carefully, without any application of oil. And if the places from whence you have removed the eschars, contain but little moisture, it is to be dried up with
soft

soft cotton, as I have already said : but if they contain much, they are to be dried gradually ; besprinkling them with the red aromatic powder, composed of aloe, frankincense, sarcocol, and dragon's blood, especially if they begin to lessen, and sink in ; and with alum and Andarene salt, if they are even with the rest of the surface of the body, and do not sink in : then wait till a new eschar or scab is formed on them. If there be any return of moisture, repeat the same dressings. And in fine, when the moisture is entirely exhausted, then anoint the parts with oil, until the crusts are softened, and all fallen off.

Next follows a discourse on destroying the marks of the small-pox.

C H A P. XI.

Of destroying the marks of the small-pox.

THE marks of the small-pox are of two sorts : for they are either in the eye, or on the rest of the body. Now, with respect to the eye, the part on which the small-pox broke out, has an opaque whiteness in it, as we have already observed. If this happens in the eyes of children, or young persons of a moist constitution of body, and tender skin, it will be the more easily deterged.

Now, the medicines which deterge the eye, and take off the whiteness, are these : borax, or nitre made into cakes, Andarene salt, sal-ammoniac, glass, the scorix of glass, coral, tutty, lapis hæmatites, verdigrease ; bastard sponge, the sea-crab, the dungs or excrements of sparrows, swallows, starlings, mice, bats,

bats, and of the Arabian or Lybian lizard; musk, the sediment of urine; the acorus, ebony, cornel-water, Arabian sugar, dregs of vinegar burnt, myrrh, sandarach or juniper gum, commonly called *varnish*, gums of the olive and bitter almond-trees, and the milky juice of wild lettuce. It will be best to use these, when the patient is just come out of the bath, or after holding his head over the steam of hot water. But mild medicines alone, nay the mildest of these, are to be employed, especially in soft and moist bodies.

The description of a mild medicine, which removes the white specks from the eye.

Let the eye be sprinkled with sarcocol, and white sugar-candy.

Another more efficacious.

Let the eye be sprinkled with bastard sponge, sarcocol, and sugar.

Another still more powerful.

Take of verdigrease ten drachms; myrrh, sagapenum, sal-ammoniac, sarcocol, of each two drachms and a half; bastard sponge, scorix of glass, and borax, or nitre in cakes, of each three drachms. Then take of sweet cane ten drachms, and the same quantity of cornel-water. Boil these in ten times the weight of water, till the decoction becomes thick: then dissolve the gums in it, and mix all well together into an ophthalmic collyrium. Afterwards, as occasion shall require, to this mixture add ebony in an oil-bottle. Cleanse the part affected gently and often with a needle or style; taking care to apply the collyrium frequently, both before and after the operation. And lastly, sprinkle it with the powder of

the milder sort of the medicines. But be sure to look carefully into the eye every day. For if it be painted, or look angry, omit this treatment for some days, and then repeat it; for this method of cure is very powerful and efficacious.

As to the medicines, which take off the marks of the small-pox from the face and the rest of the body, they are these: white litharge, dried reed-roots, rotten bones powdered, bastard sponge, coral, sarcocol, almonds, birthwort, the ben nut, radish-feed, pumpkin-feed, rocket-feed, the flower of beans, rice, lupins, and kidney-beans. On these pour the aqua amurcæ, and barley-water.

The description of a liniment, which effaces the marks of the small-pox.

Take of the flower of chiches and beans, each three drachms; of pumpkin-feed five drachms; of white litharge two drachms; of dried reed-roots three drachms. Pound all together in barley-water: then apply it to the parts several times successively, after the patient has received the steam of hot water, or after coming out of the bath. Then again wash him in a bath, made of pumpkin-rinds, dried violets, bran, and pounded chiches, boiled in water: rub him well, and apply the liniment a second time.

The description of another liniment of greater efficacy.

Take of bean-meal five drachms; bitter almonds, sweet costus, rocket-feed, and radish-feed, of each two drachms and a half: apply it, as we have already directed.

Another liniment more efficacious still.

Take of bitter almonds peeled five drachms; radish-

dish-feed, rocket-feed, roots of costus, and long birthwort, of each two drachms and a half; of borax, or nitre made into cakes, three drachms; of pepper one drachm and a half: use them as we have already directed. Afterwards, wash the parts with radish-water, or with those things which we have ordered. And those are the medicines which efface the marks and scars of the small-pox.

But in order to efface the pock-holes, and render them even with the rest of the surface of the body, do thus: Let the body be anointed with butter, and well tinged with the herb cyperis, or with its powder; let the patient use the bath frequently, and be rubbed down after it.

Now we are to direct what ought to be given to a patient in the small-pox by way of aliment, and to treat of the medicines which have relation to it.

C H A P. XII.

Of the diet of patients in the small-pox.

TO a patient in the small-pox it is necessary to give barley-water, prepared in the same manner, and with the same art, as that which is usually given to persons in acute and hot diseases. If the fever be moderate, and the body somewhat costive, it must be sweetened with white sugar-candy; but if the heat of the fever be intense, and the body loose, pour to it half a measure of the juice of acid pomegranates, pounded with their seeds: but the pulps and inward thin tunicles are to be avoided; for they are laxative.

If the patient be restless, and cannot sleep, add to

the barley-water same proportion of poppy. But if the body be very loose, add to the barley-water one part of dry seeds of acid pomegranates, and one part of poppy.

But, if it be requisite to bind the body, instead of barley-water, take meal of peeled barley, and the meal of pomegranate-seeds; boil these in the same manner as barley-water is made, and let the sick drink of this, as he would drink of barley-water; either alone, or with bambu-fugar and gum-arabic mixed with it, if a looseness should make it necessary; or with the medicines which I shall describe anon. For barley-water, mixed with pomegranate-juice, is very serviceable in the small-pox, and more especially in the measles. But the waters of the gourd, of the Indian pumpion, and of the cucumber; the mucilage of fleawort-seeds, and the like, of whatever kind, which make a mild phlegm, and easy to be spit up; these waters, I say, are more useful in the measles, than in the small-pox; unless it be in those sorts of the small-pox, which are accompanied with a malignity and heat, together with a violent fever and want of sleep.

But in those cases of the small-pox, wherein the fever and inflammation are not so vehement, those things above mentioned, and others of the like kind, have no other effect, but to render them slower, and to protract the whole course of the-disease: wherefore it will be your business to have recourse to this or that sort of medicines, or to abstain from them, as occasion shall require. For when the small-pox happens to be in the highest degree of heat and putrefaction, with the addition of moisture; then those things which have a cooling, drying, and condensing quality, are more proper; such as juice of pomegranates,

granates, verjuice, and others of the same nature.

But when the disease is the measles, which arise from a vehement ebullition of the bile blended with the blood ; those things which have the twofold virtue of cooling and humecting, are the most proper in their cure ; inasmuch as the corrupted blood is tempered and corrected by their means. For the blood of a person, in the measles, is like stagnating water, which putrefies by long standing ; whereby its natural texture is destroyed, and, by the action of the sun, it contracts a vitious acrimony. But if these waters are mixed with rain, or any other running sweet water, they soon recover their former wholesomeness.

Moreover, in the small-pox barley-gruel is beneficial, if it be taken with sugar and pomegranate-juice, or with a proper quantity of julap ; giving due attention to the patient's loose or costive state, as likewise to his greater or lesser degree of heat : except that barley-water is lighter to take, easier to swallow, and more suitable to the throat and breast. Wherefore, act according to these directions, after you have been apprized, that barley-water is more proper for persons in the measles, than in the small-pox ; unless the small-pox happen to be of a bad sort, in the manner we have mentioned.

As to the rest, vetches well cleansed are good in the small-pox, if a food be prepared of them with the juice of acid pomegranates, or with vinegar : the meal of lentils is useful also, if the meal be wrought up with cold water.

Know likewise, that cold water is more serviceable to a patient in the measles, than in the small-pox ; as being safer, and of a more certain effect.

Now,

Now, when you see the small-pox attended with great inflammation, and a stoppage in the pulse and respiration; then give extinguishing medicines, proportioned to the symptoms: if they are less urgent, employ few; if very urgent, employ many.

But never allow the eating of young birds, until the pulse and breath have returned to their natural state; nor till the pustules are thoroughly withered, and the scabs fallen off.

Let us now turn the discourse upon loosening the belly, and restringing the same in the small-pox.

C H A P. XIII.

Of managing the discharges of the belly, in the small-pox.

THE belly is generally loose in the small-pox and measles towards their decline, but especially in the measles. For which reason, every thing must be avoided which opens the body, after the small-pox and measles are conducted to the end; even though the body be bound. But if it be lax, instantly abstain carefully from those things which give stools: although it be necessary in the beginning of these two diseases, and before they are on the decline, to give a laxative. For it is sometimes requisite to open the body in the small-pox, either upon account of the excess of heat and pain in the head; or in order to ease nature of her load, and lessen the morbid matter, when you have reason to think it over-abundant. And it will be really so, when you find the body, both before and after bleeding, neither weakened nor wasted;

wasted ; but on the contrary, bloated and full, with a paleness, or a little redness, and a fluctuating pulse. For sometimes, in such a state, bleeding will not be necessary, and it will be sufficient to evacuate the superfluous humidity : and that especially, when the aforesaid signs evidently appear ; and besides, if, through the sluggishness of the fever, the body be dejected, and entirely void of a red colour. In this state, a very proper medicine is a decoction of yellow myrobalans, if it be drank with white hard sugar, and the juice of an acid pomegranate, (two or three, if there be occasion), bruised with the pulp and internal tunics. For it is the quality of these two medicines to purge the body of the superfluous humours, together with part of the bile, without raising any heat ; especially the pomegranate juice ; and to leave nothing behind them in the intestines. And this is the best medicine which can be given in this case.

But in the measles give the juice of Damascene plums, and the plums themselves, fresh gathered, either alone, or bruised with julap, adding sugar to them. But avoid the medicine called *tarangiben* * ; for it is as prejudicial in the measles, as honey is in the small-pox ; both upon account of the excessive heat which it occasions, and of increasing the nauseating and uneasiness of the sick. In like manner carefully avoid giving them the juice of ivy, or of the black violet to drink : because they both equally heighten the disorder in the body.

Now, whereas the first and most necessary remedy

* A sort of manna among the Sogdians, Medes, and Babylonians, which concretes on the leaves of certain shrubs, and is gathered thence.

in the small-pox, is to draw blood, when it is too much in quantity, or there is no prospect of checking its ebullition by any other means, even by extingvents; but there is a necessity for taking a little away, as well for relieving nature, as for abating the fulness of the blood-vessels, and easing them of their over-great load, which must otherwise be productive of very bad consequences; especially if the blood be heated to that degree, that a violent inflammation might ensue: in the same manner it behoves you, in the beginning of the measles, to draw off some of the bile, when you perceive it over-abundant; and then to pursue what remains of it by extingvents. Now, the sign of an excessive redundancy of the bile is, the violence of the inflammation, and the uneasiness, together with the discharge of the same bile, both by vomit and stool, and a bitterness in the mouth.

But if the quantity of the bile is not excessive, and yet there is an uneasiness, and thirst, and vehement heat, without any appearance of bile, either by vomit or stool; though its quantity, I say, be not excessive, we may however judge it to be of a bad quality, in proportion to the violence of the inflammation and uneasiness.

And this is what I have thought proper, that you should know, concerning the management of the discharges of the belly, when it is loose in the beginning of these two distempers. Now, if the belly be lax, give nothing laxative; for in this case, any thing that increases the discharges is not safe in either of the distempers. But while the belly continues loose, order the patient, instead of barley-water, to drink barley-gruel; and if it be necessary, boi the barley-gruel with

with meal of pomegranate-seeds; of which let him drink, before he returns to the use of barley-water. And if, this notwithstanding, the looseness still increases, mix gum-arabic and bambu-sugar in his drink in this manner,

Take of gum-arabic two drachms; of bambu-sugar one drachm: reduce them to the consistence of a collyrium: then on four ounces of the barley-gruel pour some of the medicine which I am going to describe; let it stand for an hour, and give it to the patient to drink.

The description of the medicine.

Take of red roses ground fine, bambu-sugar; sorrel-seed, fumack, and barberries, of each equal parts; also gum-arabic, sealed earth, poppy-rinds, balaustines, or pomegranate-flowers, of each half the quantity: let the patient drink three drachms of these, with one ounce of the juice of acid pomegranates.

But, if the looseness still continues, and has weakened the patient, give him draughts of al-râib, that is, four skimmed milk, with the best sort of biscuit, and a little gum-arabic.

Finally, whenever a dysentery appears, the method of cure must be taken from the place where we have treated of that subject.

Now it remains, that we speak of those who recover, and of those who die of the small-pox and measles.

C H A P. XIV.

Of the curable and incurable small-pox and measles.

THE small-pox and measles are of the number of hot diseases, and therefore have many things in common with them. Now, the chief prognostic signs in those who recover, are, a freedom of respiration, a thorough soundness of mind, and an appetite for food, an agility to motion, a right state of the pulse, the patient's good opinion of his disease, a convenient posture in bed, and but little tossing about and inquietude of body.

Hence, a judgment may be formed of bad signs, the greatest part of which we have related in the book, entitled, *Almanfori* *.

These things following particularly regard the small-pox and measles.

When the pustules of the small-pox are white, large, separate, few in number, easy and speedy in coming out, and the fever not violent or burning, nor attended with much inquietude of body or concern of mind; and are so qualified, that the heat, concern, and inquietude diminish upon their eruption, and entirely cease, when the eruption is completed: that sort is curable, and threatens little or no danger. To these the next in goodness are, white large pustules, though very numerous and coherent; if they come out easily, and their total eruption eases the patient of his uneasiness and excessive heat, as we have already mentioned.

* There is a MS. copy of this book in the Bodleian library, Narciss. Marsh, N^o 376.

BUT when their eruption is performed with difficulty, and the patient does not grow better upon their coming out, they are a bad sort : although there is not so much reason to be afraid, if he should be ill while they are coming out, as if he continues so after the eruption.

But there is a bad, and even a fatal sort of white large pustules, to wit, those which run together, and spread so, that many of them unite, and occupy large spaces of the body ; or become like broad circles, and in colour resemble fat.

As to those pustules which are white, very small, coalescing, hard, warty, and contain no fluid ; they are of a bad kind : and their badness is in proportion to the degree of difficulty in their ripening, and to the continuance of the symptoms on their eruption. But if the symptoms are not abated, after the eruption is finished, it is a mortal sign.

Those pustules also are all bad, which turn green, purple, or black. But if, besides, a swooning and palpitation of the heart come on ; this is the worst sign of all, nay a sign of certain death.

And when the fever increases after the eruption of the small-pox, it is a bad sign. But if the fever ceases at the time of the eruption, it is a good sign. Doubled pustules indicate a great quantity of the matter of the disease : and if they are of the curable kind, they portend recovery ; but if of the mortal kind, death.

Those measles are the safest, which have not too much redness : but if they turn pale, it is a bad sign ; the green and purple sorts are both mortal. When either the small-pox or measles sink in suddenly, after

they began to shoot out ; and then the patient is seized with inquietude and anxiety, and a swooning comes on ; it is a sign of speedy death ; unless they push out again, after they have subsided.

If the pustules appear on the first day of the fever, they will hasten their progress, and be of quicker motion : if the eruption is protracted to the third day, it will advance moderately ; but if the first appearance passes the fourth day, the eruption will be completed dully and slowly.

When the appearance begins on the good critical days, it is a salutary sign, especially if the patient finds himself better at the end of the eruption ; and so on the contrary. But when the pustules begin to run into one another, and to spread ; and at the same time the inquietude increases considerably, and the belly swells or is bloated ; then death is near at hand. When the smaller sort of pustules, which contain no fluid, grow hard ; and a delirium comes on at the same time ; the patient is near his end. When it happens that the small-pox and measles appear and disappear alternately, and are attended with anxiety and a delirium ; this is a sign of death, of what colour soever the pustules are : but it is seldom the case of white pustules, or of those which ripen quick. When towards the end of the small-pox there is a great perturbation of the humours, and the patient is seized with a very violent pain in a leg, hand, or any other limb ; or the pustules are speedily converted into a green or red colour ; and thereupon he grows weaker than he was before, and the weakness still increases by the quick returns of the pain, and the limb contracts various colours ; these are signs of death.

But

But if nevertheless the patient grows stronger, he will recover, and that limb will be cured.

Now, if you scarify that limb the very moment when the pain begins to seize it, you will render great service to the patient, if he grows stronger after the incision ; and the limb will also be preserved from mortification.

But, in this dangerous case, nothing cooling must be applied to the limb, upon any account whatsoever : but either scarify it, or plunge it into hot water, if you see that the patient can bear it.

Wherefore, as we have run over all the articles, which we proposed to ourselves ; and have amply enough treated, both of this disease, and the method of preservation from it ; we here break off the thread of our discourse.

*To the bestower of strength to finish this work, be
praise without end, as he is worthy of being ce-
lebrated and praised.*

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